

University of Dundee

## MASTER OF LAWS

### A critical analysis of the risks associated with crypto-currencies

Swinton, Caroline

*Award date:*  
2015

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***A critical analysis of the risks associated with crypto-currencies***

**Caroline Swinton**

**Student Number: 060004447**

**Master of Laws (By Research)**

**University of Dundee**

**August 2015**

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**(i) Declaration**

I confirm:

- *I am the author of this work;*
- *Unless otherwise stated, all references cited have been consulted;*
- *I have undertaken the work on which the thesis is a record;*
- *I have not previously been accepted, nor completed, a higher degree.*

*(Caroline Swinton)*

**(ii) Summary**

This work explores the development of crypto-currencies – a subset of virtual currencies. It aims to provide a legal analysis of the key issues, namely investor protection (or lack thereof) and the use and classification of crypto-currencies. The work analyses domestic and European legislation to explore the protections currently afforded and classification of crypto-currencies under the current legislative framework. In the latter section of the work focus will shift to consideration of the extension of the current legislative framework or consider if the sui generis nature of crypto-currencies suggests bespoke regulation is required.

The work aims to provide a starting point to assist further research in considering the exact mechanics of appropriate regulation.

*“Bitcoin is a remarkable cryptographic achievement and the ability to create something that is not duplicable in the digital world has enormous value”<sup>1</sup> Eric Schmidt*

### (iii) Introduction

Endorsement by technology heavyweights, such as Eric Schmidt, has the potential to influence discussion and consequently the popularity and growth of virtual currencies. As a result, virtual currencies<sup>2</sup> are increasingly debated in public fora as familiarity with the concept grows. Inextricably linked to increased discussion is the greater use of virtual currencies for everyday purchases<sup>3</sup> alongside further investment<sup>4</sup> and development of the virtual currencies. Influential bodies such as the UK Digital Currency Association [UKDCA]<sup>5</sup> recently estimated there are more than 500 different virtual currencies in operation<sup>6</sup> and the European Banking Authority [EBA]<sup>7</sup> predicts this number will continue to rise.<sup>8</sup> This work will focus on cryptocurrencies, a sub-set of virtual currencies, which use cryptography in their structure rather

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<sup>1</sup> CEO of Google as quoted in Jonathan Millet, *Google Chairman Eric Schmidt: Bitcoin Architecture an Amazing Achievement*, 16 March 2014, < <http://www.newsbtc.com/2014/03/16/google-chairman-eric-schmidt-bitcoin-architecture-amazing-advancement/> > accessed 4 July 2015.

<sup>2</sup> E.g. Bitcoin (as discussed further in *Chapter 1 (crypto-currencies)*).

<sup>3</sup> The number of bitcoin transactions has experienced a steady increase from creation in 2009 until May 2015, where there were approximately 110,000 transactions per day on a rolling average basis on the entire global bitcoin network <<http://blockchain.info/charts/n-transactions>> accessed 11 July 2015. The number of transactions experienced a considerable spike in November 2013 following a hearing in Senate (United States of America) which stressed legitimate uses of bitcoin as detailed in Homeland Security and Governmental Affairs Committee Congressional Hearing on Virtual Currencies, 18 November 2013 <<http://www.hsgac.senate.gov/media/majority-media/key-senate-committee-holds-first-congressional-hearing-on-virtual-currencies>> (Senate, USA, 18 November 2013) accessed 11 July 2015 and discussed in BBC Author, “Legitimate” Bitcoin’s value soars after Senate Hearing (BBC, London, 19 November 2013) <<http://www.bbc.co.uk/news/technology-24986264>> accessed 11 July 2015. However, this figure may be compared to the number of Faster Payments Scheme Transactions in November 2014 there were approximately 89 million transactions monthly (approximately 2,966,666 per day) in the UK alone <[http://www.paymentscouncil.org.uk/files/payments\\_council/publications\\_2014/free\\_industry\\_statistics\\_2014/monthly\\_clearing\\_statistics\\_nov\\_2014.pdf](http://www.paymentscouncil.org.uk/files/payments_council/publications_2014/free_industry_statistics_2014/monthly_clearing_statistics_nov_2014.pdf)> accessed 11 July 2015.

<sup>4</sup> Coindesk Author, *State of Bitcoin Q1 2015: Record Investment Buys Ecosystem*, (Coindesk, USA, 10 April 2015) < <http://www.coindesk.com/state-of-bitcoin-q1-2015-record-investment-buys-ecosystem/> > accessed 11 July 2015.

<sup>5</sup> United Kingdom Digital Currency Association [UKDCA] is a non-profit organisation established to forward the opportunities associated with digital currencies. The organisation responded to the Government’s call for information on digital currencies and will be referred to throughout this thesis. Further information about the organisation is available at <<https://www.ukdca.org/>> accessed 11 July 2015.

<sup>6</sup> United Kingdom Digital Currency Association, *The UK Digital Currency Association’s response to HM Treasury’s Digital Currencies: Call for Information*, (UKDCA, London, 3 December 2014) < [http://www.ukdca.org/downloads/UKDCA\\_HMT\\_Digital\\_Currencies\\_031214.pdf](http://www.ukdca.org/downloads/UKDCA_HMT_Digital_Currencies_031214.pdf) > p16, accessed 11 July 2015.

<sup>7</sup> European Banking Authority [EBA] is an independent EU Authority working to ensure effective and consistent prudential regulation and supervision. Further information is available <<http://www.eba.europa.eu/>> accessed 4 July 2015.

<sup>8</sup> European Banking Authority, *Opinion on Virtual Currencies* (4 July 2014) <<http://www.eba.europa.eu/documents/10180/657547/EBA-Op-2014-08+Opinion+on+Virtual+Currencies.pdf>> p10, accessed 11 July 2015.



than an ancillary means of security. Patently, crypto-currencies are gaining in popularity. However, as a result of the relative novelty of crypto-currencies, commentaries provide a high level analysis of crypto-currencies and specific issues in isolation with few attempts to date to compile into a comprehensive work. Owing to the continuing evolution of crypto-currencies there is a lack of in-depth legal and regulatory review<sup>9</sup> of the key risks. Detailed legal review forms the basis for regulation and as such the absence explains the inadequacy of the current regulatory framework. The Financial Action Task Force [FATF] noted that *“the rapid development, increasing functionality, growing adoption and global nature...make national action...a priority.”*<sup>10</sup> There are now green shoots of regulatory interest;<sup>11</sup> the UK Government published responses to a consultation on virtual currencies in March 2015,<sup>12</sup> FATF released updated guidance on crypto-currencies in June 2015 and European Securities and Markets Authority [ESMA] published a call for evidence on investments using virtual currency or distributed ledger technology in early 2015.<sup>13</sup> However the pace of development and time lag to introduce a regulatory framework means that, at present, there remains little or no protection for investors and users of crypto-currencies.

This thesis aims to provide an in-depth legal analysis of the rapid development and key risks associated with crypto-currencies under the current regulatory framework. Owing to the noted breadth of discussion on crypto-currencies there are a number of avenues this analysis could take. The thesis has been deliberately selective. As such, an analysis of the “back office” aspects of the Blockchain and reward creation will not be undertaken due to the difficulty in a peer to peer system of determining the governing law when each peer, wherever located globally, is equally important in validating transactions. In such a system it is impossible to

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<sup>9</sup> A conference on crypto-currencies was held on 12<sup>th</sup> June 2015 at the University of Birmingham with subject matter legal experts from across the world providing information. This shows there is appetite for legal debate on the topic. Further information and videos available at:

<<https://controllingcryptocurrencies.wordpress.com/programme/>> accessed 11 July 2015.

<sup>10</sup> FATF Guidance, *Guidance for a risk-based approach to virtual currencies*, June 2015 <<http://www.fatf-gafi.org/media/fatf/documents/reports/Guidance-RBA-Virtual-Currencies.pdf>> accessed 11 July 2015.

<sup>11</sup> HM Treasury undertook a review of crypto-currencies publishing a call for information late in 2014. The author has been involved in providing feedback to the Call for Information which officially closed on 3 December 2014. The HM Treasury response published in March 2015 is explored further in the following chapters. The FATF initiative have also published two guidance papers, discussed further in *Chapter 5 (Regulation)* at 5.4.3 (*Money Laundering*).

<sup>12</sup> The UK's National Crime Agency is now leading a multi-agency response to evaluating and responding to the threat posed by the criminal use of virtual currencies. The initial scope of virtual currencies is noted in: National Crime Agency, *National Strategic Assessment of Serious and Organised Crime 2015*, 23 June 2015, <<http://www.nationalcrimeagency.gov.uk/publications/560-national-strategic-assessment-of-serious-and-organised-crime-2015/file>> accessed 11 July 2015.

<sup>13</sup> European Securities and Markets Authority, *Call for evidence: investment using virtual currency or distributed ledger technology*, 22 April 2015 (closed 21 July 2015) <[http://www.esma.europa.eu/system/files/2015-532\\_call\\_for\\_evidence\\_on\\_virtual\\_currency\\_investment.pdf](http://www.esma.europa.eu/system/files/2015-532_call_for_evidence_on_virtual_currency_investment.pdf)> accessed 11 July 2015.

ascertain the legal system governing the relationships arising from transactions recorded in the Blockchain. The thesis will instead focus on the interactions between crypto-currencies and consumers through the medium of exchanges.

Firstly, the thesis will draw on the regulatory objective of consumer protection and identify the legal risks faced by consumers when engaging in crypto-currency transactions. This will examine the entire crypto-currency framework and the platforms for conversion to and from fiat currencies<sup>14</sup> rather than crypto-currencies in isolation. Secondly, as part of the analysis, the thesis will consider the nature and use of crypto-currencies by considering what crypto-currencies are and trace their development and interaction with gateways to the regulated financial system. In order to do so the study will analyse application of money and payment terminology to the use of crypto-currencies. This will identify the properties of crypto-currencies - whether crypto-currencies are money and a mode of payment in the traditional sense or rather crypto-currencies should be aligned to commodities with crypto-currency transactions being akin to commodity exchange. The thesis will also consider if crypto-currencies are a unique product consisting of an amalgam of money and commodities.

The conclusions reached in the initial chapters will form the basis for analysis in the following chapters to consider the protections available to consumers with an analysis of private international law provisions to determine the connecting factors, applicable legal system and regulatory environment. Recommendations will then be offered as to the most appropriate legal mechanisms to protect consumers and whether crypto-currencies, with their decentralised nature, can be assimilated into existing, established legal frameworks governing financial products and markets or whether they are sui generis in nature – a hybrid of commodities and money – which therefore require the development of sui generis legal concepts to fit with their innovative structures and operation.

The intention is to state the current law as at 1<sup>st</sup> August 2015 but where possible account has been taken of subsequent developments.

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<sup>14</sup> Often deemed “real” money or “real” currency. Further information in the Glossary.

**(iv) Glossary**

<b>51% Attack</b>	The largest potential threat to crypto-currencies. Where one person or group controls 51% of the mining power they can effectively control the production of new blocks and blur true ownership on the Blockchain.
<b>Altcoin</b>	Decentralised crypto-currency composed of a unique string of numbers and letters that constitutes units of currency. Altcoins developed from the principles of bitcoin, building different algorithms and based on different founding principles regarding creation and rewards. The specific principles are technologically specific and analysis of the terms of the founding protocols are outwith the scope of this thesis. The most popular altcoins include Ripple, Litecoin and Dogecoin.
<b>Bitcoin</b>	The most popular decentralised crypto-currency. It is composed of a unique string of numbers and letters that constitute units of currency and are used by the crypto-currency network in exchange for goods and services. The founding principles are contained in the bitcoin protocol available at <a href="https://bitcoin.org/bitcoin.pdf">&lt;https://bitcoin.org/bitcoin.pdf&gt;</a> . The principles identify the rules surrounding creation and understanding of the algorithmic processes. This will be discussed in some detail in <i>Chapter 1 (Crypto-currencies)</i> however, further in-depth technical analysis should be sought for the specifics regarding creation, for example by reviewing the protocol.
<b>Blockchain or Ledger</b>	The sequential public proof of work ledger system detailing all transactions which have ever taken place on a specific crypto-currency network. The blockchain is constantly expanding as new transactions and completed “blocks” are added with a new set of recordings. The technology underlying the Blockchain means there is no one central authority in control of Blockchain and all users can rely on the information contained therein. The key threat to the Blockchain is a 51% attack.
<b>Block rewards</b>	The rewards to miners for the proof of work i.e. the reward for proving / solving the transaction before other miners. Rewards are the creation of new bitcoins for the proof of work. Rewards diminish over time in accordance with the Blockchain protocol.
<b>Crypto-currency</b>	Maths based, decentralised convertible virtual currencies. Crypto-currencies use the principles of cryptography in structure and are detailed in the founding protocols of the relevant crypto-currency. Examples include Bitcoins and Altcoins. In contrast with fiat currencies, crypto-currencies are not universally accepted in any country of issue.

<b>Digital currencies</b>	A digital representation of either virtual currencies or fiat currencies. For the purposes of this thesis the term virtual currencies will be used in place of digital currencies.
<b>E-money</b>	Digital representation of fiat currency used to electronically transfer value denominated in fiat currency.
<b>Exchange(s)</b>	A platform established to exchange virtual currencies for fiat currencies, funds or other forms of virtual currencies. Exchanges also offer online hosted wallets to store and deposit virtual currencies and effect transfers to other users. Examples include MtGox and Bitstamp.net. (discussed further in <i>Chapter 1 (Crypto-currencies) at 1.4 (Case Studies)</i> ).
<b>FX</b>	A widely used global decentralised market for the trading of fiat currencies. Also known as foreign exchange market, forex or currency market.
<b>Fiat currencies</b>	Often deemed “real” money or “real” currency. Fiat currency in the UK is sterling, being the coin and paper money designated as legal tender. Fiat currencies are universally accepted as a means of exchange in the issuing country.
<b>Hash Rate</b>	The hash rate is the measuring unit of the processing power of the crypto-currency network. Mathematical operations are undertaken for security purposes at a hash rate per second, per hour etc. For example 5 Th/s means 5 trillion calculations a second.
<b>LIBOR</b>	The London Inter-Bank Offered Rate. This is set daily as the interest rate benchmark for a broad range of financial transactions. It was formerly administered by the British Bankers Association [BBA] and the setting of LIBOR is now a regulated activity in the UK supervised by the Financial Conduct Authority. It is now administered by NYSE Euronext Rates Administration Limited.
<b>Miners</b>	Those operating the computers running the software to solve the crypto-currency algorithms. Originally this could be run on home PCs but miners increasingly pool to utilise supercomputers specially optimised to perform this function.
<b>Mining</b>	Where an entity that participates in virtual currencies runs software to solve complex algorithms and validate transactions in a virtual currency system. Such validation is noted in blocks in the Blockchain.
<b>Nonce</b>	A nonce is a random piece of data which is added to the block in order to create a unique string of numbers. For example, in the most popular crypto-currency Bitcoin, the nonce is an incremental number that is added to the block for every computation. Each newly solved block will have a new nonce added.
<b>Online or hosted wallets</b>	The facility used to store, hold or transfer virtual currencies. Online or hosted wallets can be stored centrally on a crypto-currency exchange or by downloading

	<p>the application to a user's tablet / laptop / computer / smart phone. Online or hosted wallet are each attributed a code e.g.</p> <p><a href="#">1QCerSNwoZysfHQ5KeuBZMLBsLZEQU4DxY</a></p>
<b><i>Proof of Work</i></b>	<p>Miners compete to produce proof of work through a process of trial and error to validate crypto-currency transactions. Proofs of work are tied to the data of each block and are required for the blocks to be accepted. Each block contains the hash of the preceding block, thus each block has a chain of blocks that together contain a large amount of work. The hash of the new block is smaller than the difficulty target and serves to prove that this work has been done. Smaller target numbers reduce the range of accepted nonces thereby increasing the average time required to find a nonce and why increased computable effort is required. For example, at the end of October 2014 miners had to try 154.6 quintillion values at average to find the nonce – the number used only once.</p>
<b><i>Transaction</i></b>	<p>The transfer of crypto-currencies from one user to another. Instructions are issued to an exchange as agent of the Online or Hosted Wallet user and is given effect by recording on the Blockchain. The transaction is attributed a transaction number and it is this number which is noted on the Blockchain e.g.</p> <p><a href="#">51f76a29516a69e9adeb937d77f59ec6ac3a2ad6df0dfb906cec9fc1716e171a</a></p>
<b><i>User</i></b>	<p>An individual or company using exchanges and crypto-currencies for the sale and purchase of goods and services.</p>
<b><i>Virtual currencies</i></b>	<p>Digital representation of value that can be digitally traded. Also known as digital currency; digital cash; electronic currencies; crypto-currencies and cryptocurrencies.</p>

**(v) Abbreviations**

<b>AML</b>	Anti-Money Laundering
<b>BBA</b>	British Banking Authority
<b>CDD</b>	Customer Due Diligence
<b>COBS</b>	Conduct of Business Sourcebook
<b>COLL</b>	Collective Investment Schemes Block of the FCA Sourcebook
<b>CHAPS</b>	Clearing Houses Automated Payment System
<b>DISP</b>	Dispute Resolution: Complaints Block of FCA Sourcebook
<b>EBA</b>	European Banking Authority
<b>ESMA</b>	European Securities and Markets Authority
<b>FATF</b>	The Financial Action Task Force
<b>FCA</b>	Financial Conduct Authority
<b>FIT</b>	Fit and Proper Person test for Approved Persons Block of FCA Sourcebook
<b>FOS</b>	Financial Ombudsman Service
<b>FSA</b>	Financial Services Authority
<b>FSCS</b>	Financial Services Compensation Scheme
<b>FSMA</b>	Financial Services Markets Act 2000
<b>FX</b>	Foreign Exchange Trading
<b>PERG</b>	The Perimeter Guidance Manual of FCA Sourcebook
<b>POCA</b>	Proceeds of Crime Act 2002
<b>HMT</b>	HM Treasury
<b>OTC</b>	Over the Counter Operations
<b>MAR</b>	Market Conduct Block of FCA Sourcebook
<b>PRIN</b>	High Level Principles for Business Block of FCA Sourcebook
<b>SYSC</b>	Senior Management Arrangements, Systems and Controls Block of FCA Sourcebook
<b>UKDCA</b>	United Kingdom Digital Currency Association

## Chapter 1: Crypto-Currencies

### 1.1: The concept

For the purposes of this thesis virtual currencies can be defined as a representation of value that can be digitally traded as a means of exchange.<sup>15</sup> This thesis will focus on analysing a subset of virtual currencies - mathematically based crypto-currencies, the generic term used to describe virtual currencies which incorporate the principles of cryptography in their structure rather than using cryptography to enhance security of the virtual currency.<sup>16</sup> Used as a representation of value, crypto-currencies can be distinguished from e-money<sup>17</sup> or internet based payment mechanisms<sup>18</sup> which are digital representations of fiat currencies used to purchase goods and services. E-money and internet based payment mechanisms are governed by European Directives transposed into national legislation.<sup>19</sup> To analyse the adequacy or otherwise of the current European and national legislative framework in governing the use of crypto-currencies as money, payment and deposits this section will examine what crypto-currencies are, the operation of crypto-currencies and identify and analyse the inherent problems associated with both crypto-currencies and exchanges.<sup>20</sup> Owing to the already noted lack of published legal analysis this chapter proposes to identify appropriate case studies to elucidate present use of crypto-currencies and exchanges and contextualise the abstract principles. The objective is to provide a high level overview of crypto-currencies and the infrastructure established to exploit this computer science breakthrough rather than an abstract analysis of crypto-currencies in isolation.

Firstly, crypto-currencies can be categorised into the two most prevalent types:

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<sup>15</sup> See remainder of this *Chapter 1 (Crypto-currencies)* and glossary of terms for further information regarding the operation of crypto-currencies.

<sup>16</sup> Topical news stories suggest crypto-currencies are a relatively new invention, however they were proposed as early in 1982 in a paper by David Chaum, *Blind Signatures for untraceable signatures*, 1982 / 1983 <<http://scweb.sce.uhcl.edu/yang/teaching/csci5234WebSecurityFall2011/Chaum-blind-signatures.PDF>> accessed 11 July 2015. The paper outlined an anonymous e-cash scheme using cryptography for payments. Although a number of other systems were proposed in the intervening period, the concept of crypto-currencies garnered interest following the self-published introductory paper by Satoshi Nakamoto in 2008 regarding the establishment of bitcoin. Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System*, 31 October 2008 <<http://www.cryptovest.co.uk/resources/Bitcoin%20paper%20Original.pdf>> accessed 11 July 2015. Bitcoin is the most popular crypto-currency and is discussed further in this chapter.

<sup>17</sup> As defined in the glossary and further examined in *Chapter 5 (Regulation)* e-money is a digital representation of fiat currency, for example, adding funds to a paypal account to transfer and pay electronically by fiat currencies.

<sup>18</sup> As further examined in *Chapter 3 (Payment)* and *Chapter 4 (Consumer Protections)* at 4.8 (*E-Commerce*).

<sup>19</sup> As examined further in *Chapter 5 (Regulation)* at 5.6 (*Electronic Money*).

<sup>20</sup> Exchanges are platforms established to exchange crypto-currencies for fiat currencies, funds or other forms of virtual currencies. Examples are discussed further in *Chapter 1 (Crypto-currencies)* at 1.4 (*Case Studies*).

1. Convertible (or open) crypto-currencies which are exchangeable for fiat currencies. Fiat currencies can be converted to a crypto-currency, which is then retained or exchanged for goods or services and re-exchanged for fiat currencies at the current “exchange rate.” Examples include Bitcoin,<sup>21</sup> Litecoin, Ripple, Darkcoin and Dogecoin.<sup>22</sup>
2. Non-convertible (or closed) crypto-currency schemes for use only in the virtual communities in which they are developed.<sup>23</sup> Non-convertible crypto-currencies (also known as unidirectional crypto-currencies) are noted for sake of completeness. They cannot be used as a means of universal exchange, having a value only within the game or virtual world in which they can be traded. As a result they do not satisfy the legal criteria to constitute currency or money. Accordingly unidirectional crypto-currencies will not be considered further in this thesis.

This categorisation captures the types of crypto-currencies at the time of writing but that may expand as technology advances.

## 1.2: Operation

Crypto-currencies are “a digital representation of value that is neither issued by a central bank or a public authority...”<sup>24</sup> That quality of crypto-currencies is at once a strength and weakness. The crypto-currency system is supervised by the computer networks of a series of distrustful, yet interested parties, which monitor and protect the open source network in exchange for opportunities to accrue further units of crypto-currency i.e. a decentralised peer-to-peer

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<sup>21</sup> For the purposes of this thesis, the common naming convention will be used i.e. “Bitcoin” (capitalised) refers to the software and network infrastructure used to create the crypto-currency while “bitcoin” or “bitcoins” (lowercase) refers to the individual units of account which are purchased and transferred on the Bitcoin network.

<sup>22</sup> Analysis of the structure, use and popularity of these crypto-currencies will be detailed in the case studies later in this chapter.

<sup>23</sup> These crypto-currency schemes, which have often been in place for a number of years, are not intended to be used outwith the particular virtual community for which they are purchased. Thus, there is no link to the real economy and they cannot be used in exchange for tangible goods and services. E.g. World of Warcraft Goods <<https://eu.battle.net/shop/en/product/game/wow>> accessed 11 July 2015; or the digital currency “Linden Dollars” (L\$) utilised in the popular virtual world Second Life. There are a number of articles analysing Linden Dollars, for a general overview see Robert Bond, *Business trends in virtual worlds and social networks – an overview of the legal and regulatory issues relating to intellectual property and money transactions* 2009 Ent. L.R 2009, 20(4), 121 – 128.

<sup>24</sup> European Banking Authority, *Opinion on Virtual Currencies* (2014) <<http://www.eba.europa.eu/documents/10180/657547/EBA-Op-2014-08+Opinion+on+Virtual+Currencies.pdf>> at p5, accessed 11 July 2015.



monitoring system with no official<sup>25</sup> oversight as commonly provided by a central bank or other regulator.

In a crypto-currency network, a user wishing to make payment issues instructions to an exchange<sup>26</sup> holding the user's online wallet or undertakes the transfer directly from the online wallet stored on their laptop or tablet. Exchanges primarily serve three functions: (i) to serve as a method of exchange from fiat currencies to crypto-currencies and back; (ii) as a platform for users to store crypto-currencies in an online wallet; and (iii) as a platform to transfer<sup>27</sup> crypto-currencies.

In relation to the transfer of crypto-currencies from one user to another information is disseminated across the network where miners compete to verify ownership of the crypto-currency through piecing together a set of mathematical algorithms or blocks to confirm ownership. This is a process of trial and error to find a nonce,<sup>28</sup> such trial and error work is also known as proof of work. Ascertainment of the nonce and proofs of work are tied to the data of each transaction and are required for the blocks to be accepted by the Blockchain. The Blockchain is the sequential public proof of work ledger system detailing all transactions which have ever taken place on the specific crypto-currency network. In return for verification of ownership, miners are awarded "block fees" or "block-rewards" i.e. newly created crypto-currency units and/or paid fees by the parties to the transaction for assisting in effecting the transfer or transaction from one user to another. Each crypto-currency has its own verification requirements with different levels of computable effort required to solve the mathematical algorithms.<sup>29</sup> Public and private keys corresponding to the sending address alongside the time and date of the transactions and the hash of the preceding block are detailed with every processed transaction and recorded in a continuously updated Blockchain. Approximately six times per hour a group of accepted transactions, a block, is added to the Blockchain. The apparently random assortment of characters are unique and required to demonstrate authenticity and ensure no double spending. The Bitcoin network protects against double

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<sup>25</sup> This can be differentiated from all fiat currencies which are subject to regulation, official oversight and monitoring. The governing regulation for fiat currencies will be examined in *Chapter 5 (Regulation)* with consideration of adaptability or extension for governance of crypto-currencies in *Chapter 6 (Recommendations & Conclusions)*.

<sup>26</sup> Some exchanges have been subject to negative publicity which is discussed further in this Chapter at 1.4 (*Case Studies*).

<sup>27</sup> Note this is different to exchanging crypto-currencies to fiat currencies. This is the transfer of crypto-currencies to another user in the form of crypto-currencies.

<sup>28</sup> A nonce is a random piece of data which is added to the block to create a unique string of numbers. Each newly created crypto-currency will have a nonce added. Further information is detailed in the glossary of terms in the preliminaries.

<sup>29</sup> For example, Bitcoin and Litecoins use different hashtag algorithms. The algorithms used by Litecoin result in faster confirmation times compared with Bitcoin. All altcoins (discussed below) are variations of the bitcoin network principles.

spending i.e. where there is an attempt to use bitcoin credit more than once, by comparing each transaction against the previous “blocks” added to the Blockchain. It protects against double spending by not giving effect to the second transaction. The adding of verified transactions to the Blockchain as proof of work<sup>30</sup> confirms the transaction<sup>31</sup> to the rest of the network.<sup>32</sup> Confirmation of the transaction occurs once it has been published to the Bitcoin network on the public ledger. Debate occurs as to the stage at which confirmation of the authenticity becomes certain and unchallengeable – this is commonly accepted to be once a block is 6 blocks deep i.e. it has gone through further transactions and been repeated in subsequent blocks a further 6 times. Crypto-currencies are acquired by the recipient as a secondary or derivative form of acquisition of ownership from another user. In contrast mining operations and block rewards as the original mode of acquisition of ownership. Ultimately, when crypto-currencies reach maximum issuance these methods of transfer will be the only means of exchanging crypto-currencies.

In the early stages, mining was akin to an unprecedented, certainly in digital times, arms race, with miners competing to solve the computational algorithms, developed by the crypto-currency protocols. Miners<sup>33</sup> economically benefited from early investment in the technology required to crack the mathematical problems firstly by receiving the reward of bitcoins and secondly by virtue of the rise in price of bitcoins. However, owing to the founding principles of crypto-currencies<sup>34</sup> the block fees payable (or new crypto-currencies awarded) for solving the algorithms continually diminish. In addition to block rewards miners may also levy transaction fees. In order to make transactions economically viable, miners’ transaction fees charged to users will require to increase to offset these reduced block rewards. Additionally, the costs associated with solving the algorithms are increasing owing to the advanced technology with

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<sup>30</sup> Edward Southhall and Mark Taylor, *Bitcoins*, CTLR 2013 19(6), 177 – 178 at 177; and Nicolas Houy, *It will cost you nothing to “kill” a proof-of-stake crypto-currency*, January 2014, <<http://ssrn.com/abstract=2393940>> accessed 11 July 2015.

<sup>31</sup> Nicolas Courtois and Lear Bahack, *On subversive miner strategies and block withholding attack in bitcoin digital currency*, 2 December 2014 <<http://arxiv.org/pdf/1402.1718v5.pdf>> accessed on 11 July 2015.

<sup>32</sup> For the purposes of this thesis a high level overview of *how* crypto-currencies are created and exchanged has been detailed. There are many sources detailing the computer science involved in mining and exchange and should be considered if a fuller technological overview of crypto-currencies is sought. See Meni Rosenfeld, *Analysis of Bitcoin Pooled Mining Reward Systems*, 22 December 2011 <<http://arxiv.org/pdf/1112.4980v1.pdf>> accessed 11 July 2015; or Nicolas Courtois et al, *The Unreasonable Fundamental Incertitudes Behind Bitcoin Mining*, 10 April 2014 <<http://arxiv.org/pdf/1310.7935v3.pdf>> accessed 11 July 2015.

<sup>33</sup> Individuals are commonly referred to as “miners” however, for the avoidance of doubt, the complex machinery and computational effort required to validate the transactions are actually mining (or solving) the mathematical problems to prove ownership.

<sup>34</sup> E.g. Bitcoin protocol available at <<https://bitcoin.org/bitcoin.pdf>> accessed 11 July 2015; Ripple protocol available at <[https://ripple.com/knowledge\\_categories/ripple-protocols/](https://ripple.com/knowledge_categories/ripple-protocols/)> accessed 11 July 2015. Additionally, see the case studies below regarding the implementation and use of crypto-currencies.

which miners require to be equipped to compete and the computable effort required involving the consumption of prodigious quantities of electricity as well as competition from other miners.

As noted previously, initially, individuals with specialist computational technology could profitably mine crypto-currencies (Figure 1), however the competitiveness<sup>35</sup> of mining combined with the complex mathematical algorithms and technological requirements has resulted in individuals, initially key in the race, no longer profitably “mining.” Figure 2 pictorially represents the sophisticated technology<sup>36</sup> businesses now dedicate to mining crypto-currencies. The limited number of users and companies which have the required technology to “crack” the algorithms questions the de-centralised nature and founding principles of crypto-currencies. This increases the possibility of a pool of miners expanding to constitute 51% or more of the overall mining industry. By holding the majority a dominant pool can dictate the answers to the entire industry with results for its own interest but the “wrong” answers for the crypto-currency industry – a so called 51% attack. As well as vault facilities for allegedly safekeeping the crypto-currency assets of customers,<sup>37</sup> a number of larger exchanges now offer services, including online wallets, transmission of crypto-currency funds and conversion of fiat currencies to crypto-currencies. The crypto-currency eco-system is becoming increasingly reliant on such presently unregulated yet trusted service providers. This reliance was recently demonstrated when a security breach at one of the largest and well-known exchanges, bitstamp.net in January 2015<sup>38</sup> resulted in pricing uncertainty across the entire

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<sup>35</sup> The competitiveness refers to the competition between miners working to solve the algorithms to confirm the transaction. Solving the problems is rewarded with block rewards of crypto-currencies.

<sup>36</sup> Mining pools refers to the collective effort of organisations to crack the algorithms and split the associated costs. This is more profitable than continuing on an individual basis.

<sup>37</sup> The vault may be a “hot” vault held on a computer connected to the network or it may be “cold storage” solution where the private keys are converted typically to paper format and the paper is then stored securely and can be scanned back to digital format.

<sup>38</sup> As discussed later in this chapter and in the forthcoming chapters bitstamp.net suffered a significant security breach on 5 January 2015 and temporarily suspended services until 9pm on 9 January 2015. Users were instead provided with the following message:

An important message to our customers: January 6, 2015, 12:34am UTC

We have temporarily suspended Bitstamp services. Bitstamp customers can rest assured that their bitcoins held with us prior to temporary suspension of services on January 5th (at 9am UTC) are completely safe and will be honored in full. On January 4th, some of Bitstamp’s operational wallets were compromised, resulting in a loss of less than 19,000 BTC. Upon learning of the breach, we immediately notified all customers that they should no longer make deposits to previously issued bitcoin deposit addresses. To repeat, customers should NOT make any deposits to previously issued bitcoin deposit addresses. As an additional security measure, we suspended our systems while we fully investigate the incident and actively engage with law enforcement officials. This breach represents a small fraction of Bitstamp’s total bitcoin reserves, the overwhelming majority of which are held in secure offline cold storage systems. We would like to reassure all Bitstamp customers that their balances held prior to our temporary suspension of services will not be affected and will be honored in full. We appreciate customers’ patience during this disruption of services. We are working to transfer a secure backup of the Bitstamp site onto a new safe environment and will be bringing this online in the coming days. Customers can stay informed via updates on our website, on Twitter (@Bitstamp) and

crypto-currency ecosystem.<sup>39</sup> The effects of the outage demonstrates the increasingly centralised nature of the crypto-currency infrastructure with a limited pool of “miners”<sup>40</sup> and key players operating exchanges. The centralisation of powers arguably provides an opportunity to secure the input of those involved in mining and effectively regulate the area.<sup>41</sup>

Figure 1



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Figure 2



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An entire infrastructure including exchanges,<sup>44</sup> converters and expert advisers<sup>45</sup> has blossomed with the growth of crypto-currencies. The speed of technological developments in this area has not been replicated by advancements in adequate regulation.<sup>46</sup>

### 1.3: Inherent Problems

The inherent problems associated with crypto-currencies and exchanges will now be considered. Critics of crypto-currencies commonly present these problems as the basis for the introduction of regulatory regimes.

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through Bitstamp customer support at [support@bitstamp.net](mailto:support@bitstamp.net). - Bitstamp Team <<https://www.bitstamp.net/>> accessed 6 January 2015.

<sup>39</sup> Pete Rizzo, *Bitstamp's ongoing outage echoes through bitcoin economy*, (Coindesk, USA, 6 January 2015) <<http://www.coindesk.com/bitcoin-ecosystem-feels-far-reaching-effects-bitstamp-outage/>> accessed 11 July 2015.

<sup>40</sup> Nicolas Courtois and Lear Bahack, *On subversive miner strategies and block withholding attack in bitcoin digital currency*, 2 December 2014 <<http://arxiv.org/pdf/1402.1718v5.pdf>> accessed on 11 July 2015.

<sup>41</sup> The appropriateness of current regulation will be analysed further in *Chapter 5 (Regulation)* and the gaps identified in *Chapter 6 (Recommendations & Conclusions)* along with recommendations for appropriate regulation of the crypto-currency eco-system.

<sup>42</sup> <<http://i.imgur.com/wfBGbcq.jpg>> accessed 4 July 2015.

<sup>43</sup> <<http://cdn5.thinkcomputers.org/wp-content/uploads/2014/04/bitcoin-mining.jpg>> accessed 4 July 2015.

<sup>44</sup> Examples detailed in the forthcoming case studies.

<sup>45</sup> The leader in this field is coindesk <<http://www.coindesk.com/>> accessed 4 July 2015, regularly producing facts, figures and analysis of crypto-currencies and exchanges.

<sup>46</sup> This will be discussed further in *Chapters 5 (Regulation)* and *6 (Recommendations & Conclusions)*.

### 1.3.1: Loss

External factors contribute to the risks associated with owning crypto-currencies including embezzlement, fraud, technological or accessibility problems. If an individual user loses his / her online wallet details, suffers hardware malfunction or loses the private key for transfer of the crypto-currency it has the effect of removing the “money” from circulation. The crypto-currency still remains on the Blockchain but, without the private key(s) to retrieve it, no transfer can be effected.<sup>47</sup> Therefore technological problems can result in the irrecoverable loss of crypto-currencies. It appears many users continue to be unaware of this risk.<sup>48</sup>

### 1.3.2: Theft and Insolvency

A number of exchanges have recently been subjected to well publicised alleged hacking and attacks by criminals seeking to profit from inadequate security measures which might be required of exchanges if they became subject to regulation. Alternatively, it is conceivable that owing to the lack of regulation it is, or would be, relatively easy – particularly given the technological steps required to establish and trade - for an exchange to claim it has been subject to hacking and therefore had lost the crypto-currencies stored therein. Owing to the anonymity of the users of the platform, the exchange could actually have been involved in the “hacking” or “attack” or simply in misappropriation of the funds itself thereby profiting from the lack of regulatory scrutiny. The “lost”<sup>49</sup> crypto-currencies are then simply transferred to online wallets operated by the exchange on their own behalf. Recent examples of problems with exchanges include the alleged hack of the exchange Mintpal in July 2014 resulting in the loss of \$2m of bitcoin.<sup>50</sup> Another exchange, Moolah, became insolvent following an alleged bug in

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<sup>47</sup> For example the news story of an individual searching for a hard drive for the private key after realising the value of bitcoins, BBC Author, *James Howells searches for hard drive with £4mworth of bitcoins stored*, (London, 28 November 2013) < <http://www.bbc.co.uk/news/uk-wales-south-east-wales-25134289>> accessed 11 July 2015.

<sup>48</sup> Matthew Sparkes, *The £625m lost forever – the phenomenon of disappearing bitcoins*, (Telegraph, London, 23 January 2015) <<http://www.telegraph.co.uk/technology/news/11362827/The-625m-lost-forever-the-phenomenon-of-disappearing-Bitcoins.html>> accessed 11 July 2015.

<sup>49</sup> When referring to “lost crypto-currencies” the thesis refers to the transfer of the crypto-currencies out of the hosted wallets. Owing to the principles of crypto-currencies there is no ability to reverse transactions and the losses are the transferring of the crypto-currencies out of the user’s wallets, through a series of interested parties’ wallets beyond recovery. This is not akin to the burning of banknotes as ultimately someone will unjustifiably gain from the loss.

<sup>50</sup> Alex Hern, *British serial entrepreneur missing as \$1.4m bitcoin is apparently stolen* (The Guardian, London, 23 October 2014) <<http://www.theguardian.com/technology/2014/oct/23/british-serial-entrepreneur-missing-bitcoin-apparently-stolen?CMP=EMCNEWEML661912>> accessed 11 July 2015.

the software,<sup>51</sup> while the once market leading exchange MtGox<sup>52</sup> was forced to close following alleged hacking<sup>53</sup> and loss of approximately 800,000 bitcoins.<sup>54</sup> As more fully discussed below, there is suspicion regarding management involvement in the MtGox problems.<sup>55</sup> In the wake of the MtGox closure Bitstamp expanded to become the market leading crypto-currency exchange, however Bitstamp itself suffered a security breach<sup>56</sup> in January 2015<sup>57</sup> with the loss of approximately 19,000 bitcoin.<sup>58</sup> Owing to the anonymity in the use of the exchanges the creditors could not recoup the stolen or lost bitcoins and those individuals holding funds with the exchanges have not been compensated either by the exchange<sup>59</sup> or through regulatory protections. Europol has predicted that owing to the wider opportunity base for organised cybercrime it is expected that the size, complexity and reach of such crimes in relation to crypto-currencies will continue to increase.<sup>60</sup>

If crypto-currencies and the supporting infrastructure were regulated, the individuals setting up these exchanges located in the UK would be subject to authorisation by the Financial Conduct Authority [FCA]<sup>61</sup> or perhaps a new bespoke regulator. As will be examined in the

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<sup>51</sup> Alex Hern, *British serial entrepreneur missing as \$1.4m bitcoin is apparently stolen* (The Guardian, London, 23 October 2014) <<http://www.theguardian.com/technology/2014/oct/23/british-serial-entrepreneur-missing-bitcoin-apparently-stolen?CMP=EMCNEWEML661912>> accessed 11 July 2015.

<sup>52</sup> Mt Gox (Magic for Gathering Online Exchange) started as a trading venue for fantasy games and developed into a market leading exchange of crypto-currencies. Recent press coverage suggests that the loss on the MtGox platform was due to internal system manipulation and not any external attack. The articles also suggest that MtGox manipulated the value of bitcoins purchasing through accounts when the value was low then disappearing. For further information, Jon Southurst, *Missing Mt Gox Bitcoins Likely an Inside Job, Say Japanese Police*, (Coindesk, USA, 1 January 2015) <<http://www.coindesk.com/missing-mt-gox-bitcoins-inside-job-japanese-police/>> accessed 11 July 2015 and Yessi Bello Perez, *Report: Mt Gox Data Provides More Clues to Trading Bot "Willy"* (Coindesk, USA, 19 February 2015) <<http://www.coindesk.com/report-mt-gox-data-provides-more-clues-to-trading-bot-willy/>> accessed 11 July 2015.

<sup>53</sup> Recent evidence suggests the events surrounding MtGox were orchestrated internally from the outset and that funds were misappropriated systematically by a person or persons who had management roles with the institution and trusted administrator privileges. Further information is available at <<http://blog.wizsec.jp/2015/04/the-missing-mtgox-bitcoins.html?m=1>> accessed 11 July 2015.

<sup>54</sup> Alex Hern, *MtGox: That missing £70m of bitcoin? Er, here it is* (The Guardian, London, 21 March 2014) <<http://www.theguardian.com/technology/2014/mar/21/mtgox-missing-70m-bitcoin>> accessed 11 July 2015.

<sup>55</sup> Jessica Elgot, *Ex-boss of MtGox bitcoin exchange arrested in Japan over lost \$390m* (The Guardian, London, 1 August 2015) <<http://www.theguardian.com/technology/2015/aug/01/ex-boss-of-mtgox-bitcoin-exchange-arrested-in-japan-over-lost-480m>> accessed 8 August 2015.

<sup>56</sup> Stan Higgins, *Details of \$5 million Bitstamp Hack Revealed*, (Coindesk, USA, 1 July 2015) <<http://www.coindesk.com/unconfirmed-report-5-million-bitstamp-bitcoin-exchange/>> accessed 4 July 2015.

<sup>57</sup> Stan Higgins, *Bitstamp claims \$5million lost in hot wallet attack*, (Coindesk, USA, 5 January 2015) <<http://www.coindesk.com/bitstamp-claims-roughly-19000-btc-lost-hot-wallet-hack/>> accessed 11 July 2015.

<sup>58</sup> At the time of loss this valued at approximately \$5million.

<sup>59</sup> Banks in the UK offer consumers protection against online fraud, which is outwith any regulatory requirement. Therefore it is not inconceivable to suggest that the exchanges may recompense users where funds are lost.

<sup>60</sup> European Police Office, *The Internet Organised Crime Threat Assessment (IOCTA)* 2014 p86 <[www.europol.europa.eu](http://www.europol.europa.eu)> accessed 11 July 2015.

<sup>61</sup> The Financial Conduct Authority provides protection to consumers by ensuring the financial services are run appropriately. Further information is available at <<http://www.fca.org.uk/>> accessed 11 July 2015.



forthcoming chapters, regulation by the FCA is a potential governance approach. Taking the insolvency of the Moolah exchange as an example, the creator Alex Green revealed he was previously known as Ryan Kennedy, an individual known for a series of failed business ventures including Flirbre, web hosting services and Lemon,<sup>62</sup> a Bitcoin mining firm. If exchanges and the sale and transfer of crypto-currencies were regulated, for example by the FCA, it appears unlikely an unauthorised individual with several aliases and a history of failed business ventures would have satisfied the “fit and proper” person test to become a controller of an authorised business in terms of the FCA sourcebooks Fit and Proper Person test for Approved Persons Block of FCA Sourcebook [FIT]<sup>63</sup> and Senior Management Arrangements, Systems and Controls Block of FCA Sourcebook [SYSC].<sup>64</sup> The FCA test includes detailed requirements relating to a person’s honesty, integrity and reputation; competence and capability; and financial soundness. If authorisation of exchanges and the individuals who would be controllers of those businesses were introduced this would require the “fit and proper” person test to be met in order to gain authorisation to launch, own or control an exchange.<sup>65</sup> This suggests that regulation of the infrastructure surrounding crypto-currencies should be at the interface between exchanges and customers. Expressing this in another way the interface might be seen as that between the fiat currency and crypto-currency. This might be implemented as an extension of existing regulatory structure as an alternative to regulation of crypto-currencies themselves. This proposition will be considered further in Chapters 5 (Regulation) and 6 (Recommendations and Conclusions).

### 1.3.3: Lack of Central Regulation

As crypto-currencies are not legal tender in the UK,<sup>66</sup> acceptance by the providers of goods and services is not guaranteed. The lack of central regulation also results in restrictions in the protection afforded to holders. For example, should the value of crypto-currencies fluctuate there is no central body with the power to assist in stabilisation of exchange rates.<sup>67</sup> The Bank

<sup>62</sup> Alex Hern, *British serial entrepreneur missing as \$1.4m bitcoin is apparently stolen*, (The Guardian, London, 23 October 2014) <<http://www.theguardian.com/technology/2014/oct/23/british-serial-entrepreneur-missing-bitcoin-apparently-stolen?CMP=EMCNEWEML6619I2>> accessed 11 July 2015.

<sup>63</sup> Available at <<http://fshandbook.info/FS/html/FCA/FIT/1/3>> accessed 11 July 2015.

<sup>64</sup> Available at <<https://fshandbook.info/FS/html/FCA/SYSC>> accessed 11 July 2015.

<sup>65</sup> By way of comparison, the FCA recently published a final notice issued to Paul Reynolds, a former director of Aspire Personal Finance Ltd prohibiting him from performing any function relating to regulated activities on the basis that he is not a fit and property person. This final notice emphasises the application of these principles in practice. FCA Final Notice 2015: Paul Reynolds, 20 May 2015 <<http://www.fca.org.uk/your-fca/documents/final-notices/2015/paul-reynolds>> accessed 11 July 2015.

<sup>66</sup> Coinage Act 1971 c24 s2 provides a definition of legal tender. The Bank of England is the Central Bank of the United Kingdom and sole issuer of legal tender banknotes in England and Wales. Further information regarding legal tender and the issuance of local currencies is available at <<http://www.bankofengland.co.uk/banknotes/Pages/localcurrencies/default.aspx>> accessed 11 July 2015.

<sup>67</sup> Price volatility and stabilisation of rates are discussed in *Chapter 2 (Money)* at 2.3.3 (*Store of Value*).

of England's<sup>68</sup> intervention in assisting Northern Rock during the run on deposits in the beginning of the financial crisis in September 2007<sup>69</sup> would not be replicated if similar problems arose in relation to crypto-currencies. To protect investors and customers and maintain the integrity of the banking system in the UK the Government was forced to nationalise Northern Rock in February 2008.<sup>70</sup> Thereafter Her Majesty's Treasury [HMT] separated the assets of Northern Rock into a new retail bank for sale while passing the proportion of the mortgage assets which were perceived to be of lower quality and therefore of greater risk of default to a resolution vehicle, Northern Rock Asset Management. Northern Rock, the new retail bank, was subsequently sold to Virgin Money in 2011 for an expected loss of £469 million.<sup>71</sup> The loss to taxpayers is however significantly greater and has been estimated at £2 billion.<sup>72</sup> Had the Government not stepped in to "rescue" Northern Rock depositors, with funds of £26 billion, would have suffered significant losses directly which would not be automatically met by Government in full through the Financial Services Compensation Scheme [FSCS].<sup>73</sup> Although they would have been covered under the sui generis guarantee issued by the Government in relation to depositors in Northern Rock.<sup>74</sup> If a similar crisis occurred with crypto-currencies, either at an individual exchange level or, more crucially, as the result of systemic failure in the entire crypto-currency network, users would not be afforded the same, or any, protections. There is no lender of last resort for crypto-currencies and because of their decentralised nature there is no central regulatory authority.

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<sup>68</sup> The Bank of England Court Minutes detail the reasoning behind the intervention in Northern Rock stating that if Northern Rock were allowed to fail it would create serious economic damage and accordingly the Bank of England intervened – at page 54 of the minutes  
<<http://www.bankofengland.co.uk/archive/Documents/archivedocs/codm/20072009/codm2007b.pdf>> accessed 11 July 2015. The serious economic damage and potential for systemic failure will be discussed further in the *Chapter 5 (Regulation)*.

<sup>69</sup> BBC Author, *The rush at Northern Rock continues*, (BBC, London, 15 September 2007).  
<<http://news.bbc.co.uk/1/hi/business/6996136.stm>> accessed 11 July 2015.

<sup>70</sup> This necessitated the passage of emergency legislation, the Banking (Special Provisions) Act 2008 c2, to provide a legal basis for so doing. See further Public Accounts Committee – Eighteenth Report, *HM Treasury: The creation and sale of Northern Rock plc*, 5 November 2012  
<<http://www.publications.parliament.uk/pa/cm201213/cmselect/cmpubacc/552/55202.htm>> at "Summary" accessed 11 July 2015.

<sup>71</sup> Commons Select Committee, *Committee publishes findings on the creation and sale of Northern Rock plc*, 16 November 2012 <<http://www.parliament.uk/business/committees/committees-a-z/commons-select/public-accounts-committee/news/creation-and-sale-of-northern-rock-plc/>> accessed 11 July 2015.

<sup>72</sup> Public Accounts Committee – Eighteenth Report, *HM Treasury: The creation and sale of Northern Rock plc*, 5 November 2012 <<http://www.publications.parliament.uk/pa/cm201213/cmselect/cmpubacc/552/55202.htm>> at "conclusions" accessed 11 July 2015.

<sup>73</sup> As introduced by Part XV (the Financial Services Compensation Scheme) ss212 – 224F of Financial Services and Markets Act c.8. The limit at the time of the collapse of Northern Rock was 100% of the first £2,000 of deposits and 90% of the next £33,000.

<sup>74</sup> Statement by HM Chancellor of the Exchequer, Alistair Darling in BBC Author, *Northern Rock deposits guaranteed*, (BBC, London, 17 September 2007)  
<<http://news.bbc.co.uk/1/hi/business/6999615.stm>> accessed 11 July 2015.



Losses would be suffered by those who had invested with no recovery prospects. The extension of protection to investors and users through the FSCS in relation to compensation and the Financial Ombudsman Service [FOS]<sup>75</sup> in relation to alternative dispute resolution would undoubtedly secure wider acceptance of crypto-currencies and are explored in the forthcoming chapters.<sup>76</sup>

### 1.3.4: Prohibition

Finally, it cannot be discounted that any regulations that might be introduced could theoretically effectively close down any or all exchanges or outlaw crypto-currencies when regulating the area.<sup>77</sup> An analogy can be drawn with the recent FCA regulation surrounding the provision of payday loans. In November 2014, the FCA confirmed a significant alteration to the landscape for payday loan companies and a reduction in potential profit margins of lenders<sup>78</sup> in an attempt to protect consumers. From 2 January 2015, payday loan providers have been obliged to comply with strict caps on interest levels and repayment amounts. This will affect the viability of the business models of most payday lenders with estimates that only the top three lenders in the UK, Wonga, Dollar and QuickQuid will be able to operate profitably from the 400 payday lenders currently in operation in the UK.<sup>79</sup> Similarly, the imposition of a regulatory scheme and transaction fee caps in relation to crypto-currencies may operate to prevent any exchange trading profitably. The immediate impact of any regulation in the sphere of crypto-currencies would undoubtedly increase volatility of the already volatile crypto-currencies and reduce the acceptance of crypto-currencies as a means of exchange. Both China<sup>80</sup> and Russia<sup>81</sup> recently banned the use of Bitcoin. Existing exchanges have been

<sup>75</sup> As introduced by Part XVI (the Ombudsman Scheme) ss225 – 234B of Financial Services and Markets Act c.8.

<sup>76</sup> As discussed in *Chapter 5(Regulation)* at 5.5.2.1(*Financial Services Compensation Scheme ("FSCS")*) and 5.5.2.2 (*Financial Ombudsman Service ("FOS")*).

<sup>77</sup> For example, new regulation in New York requires a BitLicence. Recent press has revealed bitcoin exchanges will not be applying for licences to operate in New York and are effectively removing themselves from the market. Pete Rizzo, *Bitcoin Exchanges Kraken and Bitfinex cut services in New York*, (Coindesk, USA, 9 August 2015) <<http://www.coindesk.com/bitcoin-exchanges-kraken-and-bitstamp-cut-services-in-new-york/>> accessed 10 August 2015.

<sup>78</sup> Proposal included: an initial cost cap of 0.8% per day; fixed default fees capped at £15; total cost cap of 100%. FCA Press Release, *FCA confirms price cap rules for payday lenders*, (FCA, London, 11 November 2014) <<http://www.fca.org.uk/news/fca-confirms-price-cap-rules-for-payday-lenders>> accessed 11 July 2015.

<sup>79</sup> Marion Dakers, *FCA price cap on payday lenders to "put an end to spiralling debt"* (The Telegraph, London, 11 November 2014) <<http://www.telegraph.co.uk/finance/newsbysector/banksandfinance/11222397/FCA-price-cap-on-payday-lenders-to-put-an-end-to-spiralling-debt.html>> accessed 11 July 2015.

<sup>80</sup> China banned its banks from handling bitcoin transactions in December 2013 stating that Bitcoins were a "virtual good" and had no legal status. BBC Author, *China bans banks from handing Bitcoin Trade* (BBC, London, 5 December 2013) <<http://www.bbc.co.uk/news/technology-25233224>> accessed 24 May 2015.

<sup>81</sup> Russia banned access to websites referring to bitcoin on January 13 2015. Further information available at Marco Pineda, *Russian Court Overturns Ban on Access to Bitcoin Websites*, (USA, 16 May 2015) <<https://bitcoinmagazine.com/20440/russian-court-overturns-ban-access-bitcoin-websites/>> accessed 11 July 2015.

closed down by authorities with the resulting loss of all crypto-currencies held by them. This undoubtedly impacts on the potential for crypto-currencies to be considered as a store of value and is borne out by the significant fall in value of bitcoin which followed the recent ban in China.<sup>82</sup>

### 1.3.5: Money Laundering<sup>83</sup>

Owing to the pseudo anonymity<sup>84</sup> associated with crypto-currencies the opportunities for exploitation for illegal activities are abundant. The design of many crypto-currencies and exchanges allows for user anonymity. It was estimated in 2012 that 20% of all bitcoins exchanged every day on the world's largest bitcoin exchange were spent on Silk Road,<sup>85</sup> a now defunct black market trading platform. Unless an exchange develops and invokes its own procedures for anti-money laundering the statutory regulations do not currently extend to exchanges.<sup>86</sup> Thus, users can never be certain that the crypto-currencies purchased or exchanged do not represent criminal property.<sup>87</sup> The global potential of crypto-currencies to transmit funds across nations also questions the anti-money laundering practices required of exchanges given the different practices in place regarding anti-money laundering. There is a lack of universal acceptance as to the practices to be invoked, particularly outwith the EU and countries in the Financial Action Task Force [FATF]<sup>88</sup> initiative. The introduction of effective anti-money laundering regulations would reduce the opportunities for criminals to trade with crypto-currencies and provide reassurance for legitimate users of crypto-currencies as a medium of exchange.

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<sup>82</sup> Following China's ban, the value of the bitcoin decreased by 50%, as detailed in Joseph Cook, *Bitcoins: Technological Innovation or Emerging Threat?*, 30J. Marshall J. Info. Tech. & Privacy L. 535 – 570 (2014) at 561.

<sup>83</sup> As further discussed in *Chapter 5 (Regulation)* at 5.4.1 (*Money Laundering*).

<sup>84</sup> The transfer of crypto-currencies appear anonymous, however, such transfers are inherently traceable. Although the identity of the hosted wallets may appear anonymous e.g. Mr Smith, it can be uncovered through identification of IP addresses and access location which are recorded in the Blockchain. Such methods are not straightforward and as demonstrated in the ongoing legal actions against the founders of exchanges the IP addresses are not always ascertainable and cannot necessarily be linked to the specific user – hence use of the term pseudo-anonymous.

<sup>85</sup> Edward Southhall and Mark Taylor, *Bitcoins*, CTLR 2013 19(6), 177 – 178 at 178.

<sup>86</sup> Refer to exchange terms and conditions in Appendix 2 (Terms and Conditions).

<sup>87</sup> Proceeds of Crime Act s340 (Definition of Criminal Property). That is property which is or represents the proceeds of crime. The Proceeds of Crime Act will be examined in further detail in *Chapter 5 (Regulation)* at 5.4.2 (*Proceeds of Crime*).

<sup>88</sup> Financial Action Task Force which is discussed in detail in the forthcoming chapters, specifically in *Chapter 5 (Regulation)* at 5.4.1 (*Money Laundering*). FATF have now produced guidance in relation to crypto-currencies, FATF Guidance, *Guidance for a risk-based approach to virtual currencies*, June 2015 <<http://www.fatf-gafi.org/media/fatf/documents/reports/Guidance-RBA-Virtual-Currencies.pdf>> accessed 27 June 2015.

The following section aims to consider how crypto-currencies are used and how exchanges operate to understand whether extension of the current legislative framework is appropriate to govern crypto-currencies and exchanges. Development and use of crypto-currencies is still in its early stages. This enables weaknesses in the system to be exploited by individuals and companies seeking to financially profit both legally and illegally from the lack of regulation. Additionally, the lack of anti-money laundering compliance offers opportunities to transfer and disguise the proceeds of crime. Chapters 4 (Consumer Protection) and 5 (Regulation) will then examine the current regulatory framework to determine if the inherent problems can be regulated by legislation.

#### **1.4: Case Studies**

Given the novelty of crypto-currencies there is an absence of primary legal sources in the form of case reports and legislation. There is however a variety of comments from press and other resources relating to events and key players in the crypto-currency arena. Despite Bitcoin having been established for six years, academic interest appears to have only recently been awakened with little established literature. As a result it has been necessary, in order to develop the analysis, to engage with other topical sources such as news coverage and blogs on the topic of crypto-currencies which lack detailed legal analysis and to extrapolate legal arguments from those sources.

The following examples relating to crypto-currencies and exchanges provides substance to the abstract arguments above, emphasising current exploitation and the resulting consumer detriment while illustrating some of the inherent problems in practice. The selected examples provide information on widely used crypto-currencies alongside exchanges. Owing to the number of crypto-currencies which have received varying degrees of adoption, this section has been deliberately selective but nonetheless offers adequate analysis of the most commonly encountered crypto-currencies. By considering the uses to which crypto-currencies have, to date, been put, analysis of the current regulatory gaps in the protections available will be provided.

##### **1.4.1: Case Study A: Bitcoin (crypto-currency)**

Satoshi Nakamoto's<sup>89</sup> introductory paper on Bitcoin,<sup>90</sup> considered by many as the first practical crypto-currency,<sup>91</sup> describes it as a purely peer-to-peer version of electronic money allowing online payments and exchanges directly between parties without the need to go through a

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<sup>89</sup> This is the pseudonym for the creator of Bitcoin. It is uncertain if this is an individual or a group of creators.

<sup>90</sup> Discussed at note 10 above.

<sup>91</sup> Although as noted above, the concept of crypto-currencies is not new having been introduced, albeit under a different name, by David Chaum in 1982.

central bank or financial institution.<sup>92</sup> As there is no oversight by a central authority, precautionary measures are taken to ensure security in transactions.<sup>93</sup> This paper received much interest and Bitcoins were launched on 3 January 2009 as a frontierless convertible crypto-currency.

Nakamoto noted that the payment mechanism requires to be trusted by individuals and declared that *“we need a way for the payee to know that the previous owners did not sign any earlier transactions [i.e. double spend]. For our purposes, the earliest transaction is the one that counts, so we don’t care about later attempts to double spend.....transactions must be publicly announced.....”*<sup>94</sup> Nakamoto discounted the popular solution of introducing a trusted central authority preferring a publicly announced system of transaction history, known as the ledger or Blockchain.

The paper continued to contrast the public nature of the transaction history with traditional banking, thus *“the traditional banking model achieves a level of privacy by limiting access to information to the parties involved and trusted third party. The necessity to announce all transactions publicly precludes this method, but privacy can still be maintained by breaking the flow of information in another place: by keeping public keys anonymous. The public can see that someone is sending an amount to someone else, but without information linking the transaction to anyone. This is similar to the level of information released by stock exchanges, where the time and size of individual trades, the “tape”, is made public, but without telling who the parties were.”*<sup>95</sup> The bitcoins are composed of a unique combination of letters, numbers and symbols, often referred to as a digital signature. However anonymity is maintained by not associating the digital signatures with a name but with an account also consisting of numbers and letters.<sup>96</sup> Anonymity is further preserved through the use of a private key required to transfer crypto-currencies.

Bitcoins are created through the process known as mining. The block rewards or bitcoins released as rewards for solving the algorithmic problems halves every four years – from 2009

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<sup>92</sup>Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* <<https://bitcoin.org/bitcoin.pdf>> accessed 24 May 2015.

<sup>93</sup> Joseph Cook, *Bitcoins: Technological Innovation or Emerging Threat?*, 30J. Marshall J. Info. Tech. & Privacy L. 535 – 570 (2014) at 538.

<sup>94</sup> Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* <<https://bitcoin.org/bitcoin.pdf>> accessed 11 July 2015.

<sup>95</sup> Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* <<https://bitcoin.org/bitcoin.pdf>> accessed 11 July 2015.

<sup>96</sup> Further information regarding the transaction is detailed in the glossary.

to 2012 the reward was 50 bitcoin, but since 2013 this has reduced to 25 bitcoin.<sup>97</sup> Owing to the algorithmic structure and protocol of bitcoins, the maximum number of bitcoins will be achieved when the block reward is reduced to zero and no new coins can be created<sup>98</sup> - currently estimated to be 2040. Despite this finite nature of bitcoin, they can be broken into smaller denominations, called “Satoshis”<sup>99</sup> with the ability to subdivide each bitcoin into 100 million smaller units.<sup>100</sup> Nonetheless the finite supply of bitcoins is one of the key components which may appeal to investors because their value can no longer be diluted through the issue of new units. However, many of those purchasing bitcoins are just that – investors seeking to profit from the volatility of the exchange rate of crypto-currencies, purchasing when low and selling when at optimum levels. The frequency with which individuals are using bitcoin as a means of exchange is limited.<sup>101</sup> Figure 3 details the rolling seven day average at around 100,000 transactions worldwide demonstrating a continuing level of acceptance amongst the crypto-currency community at a level considerably greater than other crypto-currencies, but these figures confirm the level of acceptance is not, at present, universal.

Figure 3



<sup>97</sup> Michal Polasik, Anna Piotrowska, Tomasz Wisniewski, Radoslaw Kotkowski, Lightfoot Geoff, *Price Fluctuations and the Use of Bitcoin: An Empirical Inquiry* (Poland and UK, 30 October 2014) <[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2516754](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2516754)> accessed on 11 July 2015.

<sup>98</sup> Mark Taylor, Rachel Savary and Ben Regnard-Weinrabe, *Virtual Currencies: the other side of the coin* Practical Law Company Article (London, 23 October 2013).

<sup>99</sup> Named after the author of bitcoins.

<sup>100</sup> Joseph Cook, *Bitcoins: Technological Innovation or Emerging Threat?*, 30J. Marshall J. Info. Tech. & Privacy L. 535 – 570 (2014) at 539.

<sup>101</sup> See generally *Chapter 2 (Money)*.

The cryptography involved in producing crypto-currencies means that the majority of crypto-currencies have a maximum issue, for example Bitcoin has a limit of 21 million coins,<sup>103</sup> the second most popular crypto-currency Litecoin<sup>104</sup> a limit of 84 million coins<sup>105</sup> and Namecoin<sup>106</sup> a limit of 21 million coins. An exception is Dogecoin,<sup>107</sup> which although, originally intended to create 100 billion Dogecoins, more recently announced that the Dogecoin network would produce an infinite number of Dogecoins. Dogecoin operates in a similar manner to Bitcoin and Litecoin using public and private keys to encode transfers. For investors however, the value of Dogecoins cannot increase as a result of the infinite supply and economics of supply and demand will dictate the price. In addition with the novelty of Dogecoins; it remains to be seen whether its use will become widespread.<sup>108</sup> The limited nature of crypto-currencies has not yet proved problematic as many crypto-currencies are not expected to reach maximum issue until around 2040. However, the finite supply will ultimately either increase crypto-currency values or result in the crypto-currencies becoming worthless. At present, as demonstrated by Figure 4 below, the value of bitcoin has been extremely volatile over the preceding 18 months.

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<sup>102</sup> Number of bitcoin transactions per day, taken on a 7 day rolling average <[https://blockchain.info/charts/n-transactions?showDataPoints=false&timespan=&show\\_header=true&daysAverageString=7&scale=0&address=](https://blockchain.info/charts/n-transactions?showDataPoints=false&timespan=&show_header=true&daysAverageString=7&scale=0&address=)> accessed 11 July 2015.

<sup>103</sup> Typically Bitcoin which is the clear leader in the field handles an average of 110,000 transactions per day <<https://bitinfocharts.com/comparison/transactions-btc-ltc-doge.html>> accessed 16 May 2015.

<sup>104</sup> Announced in 2011 by its creator, former Google engineer Charles Lee, Litecoin has a coin limit of 84 million. Litecoin is an open source, decentralised payment network also using a proof of work ledger. Again this is decoded by CPUs albeit unlike Bitcoin this can still be undertaken by consumer grade computers. Litecoin is the second largest crypto-currency after Bitcoin.

<sup>105</sup> Litecoin is presenting handling less than 3,000 transactions per day. <<https://bitinfocharts.com/comparison/transactions-btc-ltc-doge.html>> accessed 16 May 2015.

<sup>106</sup> Announced in 2011 Namecoin is based on the code of Bitcoin and uses the same proof-of-work algorithms. Further information is available at <<http://namecoin.info/>> accessed 11 July 2015.

<sup>107</sup> Launched on 8 December 2013, Dogecoin, created by Billy Markus and Jackson Palmer, aims to distance itself from Bitcoin and its association with Silk Road (discussed in detail later in this chapter). Dogecoin deals with large numbers of coin that are less in value. Further information regarding Dogecoin is available at <<http://dogecoin.com/>> accessed 11 July 2015.

<sup>108</sup> Jackson Palmer, creator of Dogecoin, recently announced his extended leave from the crypto-currency community owing to the “toxic environment” of the industry. This obviously questions the ongoing viability to dogecoin use and circulation. Further information is available in Sarah Jenn, *Dogecoin Founder Leaves Cryptocurrency Community*, *Newsbtc, Bitcoin New Service* (USA, 24 April 2015) <<http://www.newsbtc.com/2015/04/24/dogecoin-founder-leaves-cryptocurrency-community/>> accessed 11 July 2015. From around 200,000 transactions a day in early 2014 Dogecoin is handling around 14,000 transaction a day in May 2015. <<https://bitinfocharts.com/comparison/transactions-btc-ltc-doge.html>> accessed 16 May 2015.

Figure 4



109

At this stage it is difficult to predict how the value will be perceived in a further 25 years or whether discussion surrounding crypto-currencies will have ceased entirely. It is not improbable that by 2040 crypto-currencies will be considered a fad akin to the tulip mania in 17<sup>th</sup> century Holland.<sup>110</sup> Tulip mania was the first recorded speculative bubble, where over the course of four years in Holland the price of tulip bulbs increased 200 times to the equivalent value of a luxury house.<sup>111</sup> The fad passed and in one month the price dropped to almost nothing.<sup>112</sup> The volatility of crypto-currencies, particularly following the bitstamp.net outage is in some ways comparable to the bubble bursting or fad passing and crypto-currencies becoming worthless.

#### 1.4.2: Case Study B: Altcoins (crypto-currency)

Following the success of Bitcoin a number of other crypto-currencies have been developed, collectively known as Altcoins. Some are noted above. The majority are modelled on the

<sup>109</sup> Blockchain Information <[https://blockchain.info/charts/market-price?showDataPoints=false&timespan=&show\\_header=true&daysAverageString=7&scale=0&address=](https://blockchain.info/charts/market-price?showDataPoints=false&timespan=&show_header=true&daysAverageString=7&scale=0&address=)> accessed 11 July 2015.

<sup>110</sup> Neil Seitz et al, *The U.S. subprime mortgage crisis: what have we learned?* Comp. Law. 2010, 31(11) 355 - 361 at 357.

<sup>111</sup> Earl Thompson, *The tulipmania: Fact or artefact?* Springer Science + Business Media B.V. 2006 at p1.

<sup>112</sup> Earl Thompson, *The tulipmania: Fact or artefact?* Springer Science + Business Media B.V. 2006 at p4.



principles of Bitcoin with minor changes to the algorithms, Blockchains and supply. The most popular are detailed in the charts in Appendix 1A and 1B.<sup>113</sup>

These alternative virtual and crypto-currencies are not as widely accepted as bitcoins<sup>114</sup> and although use and awareness is increasing, circulation is not (yet) as extensive as bitcoin.<sup>115</sup> With an estimated 500 virtual currencies available it is difficult to predict continued use and which will be favoured by the public. However, it is evident that Governments cannot ignore the increasing number and popularity of crypto-currencies and regulation is required to protect investors, depositors and users from the illegality which has been associated with crypto-currencies hitherto.<sup>116</sup> The following examples are included to illustrate the types of criminal conduct with which crypto-currencies have become associated.

#### 1.4.3: Case Study C: Liberty Reserve (crypto-currency & exchange)

Established in 2006, Liberty Reserve was a predecessor to Bitcoin describing itself as the internet's "*oldest, safest and most popular payment processors....serving millions all around a world.*"<sup>117</sup> However the aforementioned lack of regulatory oversight meant use of Liberty Reserve became inextricably linked with money transmission by criminals. Criminals regularly laundered the proceeds of crime e.g. credit card fraud, identity fraud, investment fraud and computer hacking seamlessly and anonymously through Liberty Reserve. Transactions were conducted in Liberty Dollars which were convertible to fiat currencies thereby enabling the conversion to "clean money." It is estimated that 55 million separate financial transactions illegally laundered over six billion dollars through the Liberty Reserve platform.<sup>118</sup>

Liberty Reserve required users to register accounts with only basic identifying information, which in terms of normal money laundering checks could not be considered sufficient

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<sup>113</sup> Information in Appendix 1A is reproduced from coinmarketcap. Information correct at 20 December 2014 <<http://coinmarketcap.com/>> accessed 20 December 2014. Information reproduced in Appendix 1B is also reproduced from Marketcap and is correct at 17 May 2015. This shows the liquidity of the crypto-currency market and the changes in popularity over the period of 6 months.

<sup>114</sup> Bitcoins maintains an approximate 90% share of the total market capitalisation of all crypto-currencies in circulation. As detailed in United Kingdom Digital Currency Association, *The UK Digital Currency Association's response to HM Treasury's Digital Currencies: Call for Information*, 3 December 2014.

<sup>115</sup> Samuel Gibbs, *Nine Bitcoin alternatives for future currency investments*, (The Guardian, London 28 November 2013) <<http://www.theguardian.com/technology/2013/nov/28/bitcoin-alternatives-future-currency-investments>> accessed 11 July 2015.

<sup>116</sup> Further discussion regarding the initial steps taken by Governments are discussed in *Chapter 6 (Recommendations & Conclusions)*.

<sup>117</sup> As cited in BBC Author, *Liberty Reserve digital money service forced offline* (BBC, London, 27 May 2013) <<http://www.bbc.co.uk/news/technology-22680297>> accessed 11 July 2015.

<sup>118</sup> Erik Barnett, *Virtual Currencies: Safe for Business and Consumers or just for Criminals?* 13<sup>th</sup> European Security Conference & Exhibition (The Hague, 2 April 2014) <[http://photos.state.gov/libraries/useu/231771/PDFs/2014\\_Erik\\_Barnett\\_crypto-currencies\\_remarks.pdf](http://photos.state.gov/libraries/useu/231771/PDFs/2014_Erik_Barnett_crypto-currencies_remarks.pdf)> accessed 11 July 2015.



validation of identities. Latterly, during investigations by authorities evidence revealed users registering under blatantly false names, including “Russia hackers”; “Hacker Account” and “Joe Bogus.”<sup>119</sup> Additionally the utilisation of independent exchanges to transfer funds resulted in Liberty Reserve further avoiding collating any information to identify users. This effectively led to no party having any oversight of the users, transactions or conversion to fiat currencies, enabling criminals to anonymously launder criminal funds.

After extensive investigations the US Department of Justice charged Liberty Reserve and seven of its principals<sup>120</sup> with operating an unregistered money transmitter business<sup>121</sup> and money laundering which facilitated the movement of more than \$6 billion in illicit proceeds.<sup>122</sup> The US Department of Justice seized the website in May 2013<sup>123</sup> at which time Liberty Reserve had more than a million worldwide users.<sup>124</sup> While the US has had criminal provisions which were utilised in relation to so called wire fraud<sup>125</sup> since the 1930s there has been an

<sup>119</sup> The Financial Action Task Force (FATF) Report, *Virtual Currencies: Key Definitions and Potential AML/CFT Risks*, June 2014 < <http://www.fatf-gafi.org/media/fatf/documents/reports/virtual-currency-key-definitions-and-potential-aml-cft-risks.pdf> > accessed 11 July 2015.

<sup>120</sup> BBC Author, *FBI arrests Silk Road drugs site suspect*, (BBC, London, 2 October 2013) < <http://www.bbc.co.uk/news/technology-24373759> > accessed 11 July 2015.

<sup>121</sup> USA Federal Criminal Code, 18 U.S. Code § 1343 - Fraud by wire, radio, or television.

<sup>122</sup> The Financial Action Task Force (FATF) Report, *Virtual Currencies: Key Definitions and Potential AML/CFT Risks*, June 2014 < <http://www.fatf-gafi.org/media/fatf/documents/reports/virtual-currency-key-definitions-and-potential-aml-cft-risks.pdf> > accessed 11 July 2015.

<sup>123</sup> As cited in BBC Author, *Liberty Reserve digital money service forced offline* (BBC, London, 27 May 2013) < <http://www.bbc.co.uk/news/technology-22680297> > accessed 11 July 2015.



<sup>124</sup> The Financial Action Task Force (FATF) Report, *Virtual Currencies: Key Definitions and Potential AML/CFT Risks*, June 2014 < <http://www.fatf-gafi.org/media/fatf/documents/reports/virtual-currency-key-definitions-and-potential-aml-cft-risks.pdf> > accessed 11 July 2015.

<sup>125</sup> USA Federal Criminal Code states at 18 U.S. Code § 1343 - Fraud by wire, radio, or television, “Whoever, having devised or intending to devise any scheme or artifice to defraud, or for obtaining money or property by means of false or fraudulent pretenses, representations, or promises, transmits or causes to be transmitted by means of wire, radio, or television communication in interstate or foreign commerce, any writings, signs, signals, pictures, or sounds for the purpose of executing such scheme or artifice, shall be fined under this title or imprisoned not more than 20 years, or both. If the violation occurs in relation to, or involving any benefit authorized, transported, transmitted, transferred, disbursed, or paid in connection with, a presidentially declared major disaster or emergency (as those terms are defined in section 102 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act ([42 U.S.C. 5122](http://www.usc.gov/title-42/chapter-51/section-5122))), or affects a financial institution, such person shall be fined not more than \$1,000,000 or imprisoned not more than 30 years, or both.”

absence of similar provisions within the EU until recently. The Payment Services Directive<sup>126</sup> does not contain criminal sanctions nor does its transposition into the domestic law of the UK.<sup>127</sup> Thus, if Liberty Reserve had been founded and operated in the UK no criminal actions would lie against the principals for operating the payment systems per se but<sup>128</sup> actions might have proceeded under the Proceeds of Crime Act 2002<sup>129</sup> [POCA].

The lack of money laundering controls enabled the principals of Liberty Reserve to operate an exchange which conducted no client due diligence checks, maintained no coherent records and had no reporting obligations. Potentially, Liberty Reserve could be used for illegal purposes, yet owing to the novelty of Liberty Reserve the US Department of Justice took seven years to apply relevant regulations to charge the principals and effectively shut down the exchange.<sup>130</sup> It is not inconceivable that further illegal platforms will be developed in Europe and the USA operating outwith the sphere of regulation and on the margins of proceeds of crime provisions.

#### 1.4.4: Case Study D: Silk Road (crypto-currency exchange)

Launched in February 2011 Silk Road operated a hidden online marketplace, hosted on The Onion Router [TOR]<sup>131</sup>, for trading in illegal goods such as drugs, pornography, weapons and other unlawful goods and services. The anonymity offered by TOR<sup>132</sup> enabled criminals to exchange illegal goods and services on the marketplace anonymously. With reportedly, just under a million registered users and an estimated \$213.9m in sales and \$13.2m in

<sup>126</sup> 2007/64/EC on payment services in the internal market amending Directives 97/7/EC, 2002/65/EC, 2005/60/EC and 2006/48/EC and repealing Directive 97/5/EC and implementation into the UK through the Payment Services Regulations 2009 SI 2009/209.

<sup>127</sup> Discussed further in *Chapter 3 (Payment)* at 3.7 (*Payment Regulation*).

<sup>128</sup> However, as discussed in the forthcoming chapters extension of existing regulation may be suitable to protect consumers and impose criminal sanctions.

<sup>129</sup> Discussed further in *Chapter 5 (Regulation)* at 5.4.2 (*Proceeds of Crime*).

<sup>130</sup> Two of its principals Arthur Budovsky and Vladimir Kats had previously run a US based company GoldAge and had been convicted by US authorities in early 2007 of running an illegal wire fraud operation. See further David Boddiger; L. Arias (May 25, 2013). *Millions of dollars in limbo after shuttering of digital currency site Liberty Reserve*. Tico Times <<http://www.ticotimes.net/2013/05/24/millions-of-dollars-in-limbo-after-shuttering-of-digital-currency-site-liberty-reserve>> accessed 11 July 2015.

<sup>131</sup> TOR is free software enabling use of the internet anonymously so activities, IP address and location cannot be detected by government agencies or corporations. For the purposes of this thesis acknowledgement of the inherent anonymity of TOR is sufficient. See further Roger Dingledine et al *TOR: The Second Generation Onion Router*. US Naval Research Laboratory (2004) <<http://www.dtic.mil/cgi-bin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA465464>> accessed 11 July 2015. Further academic papers can be consulted if further information regarding the technicalities of TOR is required.

<sup>132</sup> The Onion Router freely available software for enabling online anonymity. It provides inscription including in relation to the IP address.

commissions on Silk Road before law enforcement agencies shut it down,<sup>133</sup> the marketplace was a major platform for illicit purchases and sales facilitated by crypto-currency transfers. Although a platform with the estimated monthly trading worldwide of Silk Road infers a major means of exchange for crypto-currencies, in comparison the number of payments under the Faster Payments Scheme in the UK alone, this an insignificant proportion of financial transactions.<sup>134</sup>

FATF produced a comprehensive report on the operation of Silk Road, effectively operating as a Bitcoin bank where “....every *Silk Road* user had at least one *Silk Road* Bitcoin address .... To make a purchase a user obtained bitcoins (typically through a Bitcoin exchanger) and sent them to a Bitcoin address associated with his or her *Silk Road* account to fund the account. When a purchase was made, *Silk Road* transferred the user’s bitcoins to an escrow account it maintained, pending completion of the transaction, and then transferred the user’s / buyer’s bitcoins from the escrow account to the vendor’s *Silk Road* Bitcoin address.”<sup>135</sup>

After extensive investigations<sup>136</sup> the US Department of Justice closed Silk Road and arrested the alleged owner and operator, who went under the alias of Dread Pirate Roberts.<sup>137</sup> The principal of Silk Road has recently been found guilty of wire fraud and is subject to a life sentence for the money laundering and criminal activities associated with Silk Road.<sup>138</sup> The US Justice Department also seized approximately 173,991 bitcoins worth more than \$33.6 million at the time of seizure.<sup>139</sup> At the time of seizure the quantity of bitcoin owned by Dread

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<sup>133</sup> Nicky Woolf, *Silk Road’s Dread Pirate Roberts convicted of running online drug market*, (Guardian, USA, 5 February 2015) <<http://www.theguardian.com/technology/2015/feb/04/silk-road-ross-ulbricht-convicted-drug-charges?CMP=EMCNEWEML6619I2>> accessed 11 July 2015.

<sup>134</sup> See footnote above.

<sup>135</sup> The Financial Action Task Force (FATF) Report *Virtual Currencies: Key Definitions and Potential AML/CFT Risks*, June 2014 <<http://www.fatf-gafi.org/media/fatf/documents/reports/virtual-currency-key-definitions-and-potential-aml-cft-risks.pdf>> accessed 11 July 2015.

<sup>136</sup> It has been discovered that undercover officers investigating Silk Road participated in trading on Silk Road, further information is detailed in Joe Miller, *Silk Road agents charged with stealing seized Bitcoin*, (BBC, London, 30 March 2015) <<http://www.bbc.co.uk/news/technology-32124251>> accessed 24 May 2015.

<sup>137</sup> Kate Vinton, *Ross Ulbricht’s lawyer condemns dark web threats against silk road trial judge* (USA, 24 October 2014) <<http://www.forbes.com/sites/katevinton/2014/10/24/ross-ulbricht-lawyer-condemns-dark-web-threats-against-silk-road-trial-judge/>> accessed 11 July 2015.

<sup>138</sup> Ross Ulbricht, the creator of Silk Road was convicted of all seven charges on 4 February 2015. Further information regarding the charges is available at BBC Author, *Ross Ulbricht: Silk Road creator convicted on drugs charges*, (BBC, London, 5 February 2015) <<http://www.bbc.co.uk/news/world-us-canada-31134938>> accessed 11 July 2015; Stan Higgins, *Ross Ulbricht Found Guilty of Operating Silk Road Dark Market*, (Coindesk, USA, 4 February 2015) <<http://www.coindesk.com/ross-ulbricht-found-guilty-operating-silk-road-dark-market/>> accessed 11 July 2015.

<sup>139</sup> The Financial Action Task Force (FATF) Report, *Virtual Currencies: Key Definitions and Potential AML/CFT Risks*, June 2014 <<http://www.fatf-gafi.org/media/fatf/documents/reports/virtual-currency-key-definitions-and-potential-aml-cft-risks.pdf>> accessed 11 July 2015.

Pirate Roberts, in commission alone, constituted 5% of all the bitcoin in circulation.<sup>140</sup> Opponents of crypto-currencies reference the closure of Silk Road as evidence of illegal use of crypto-currencies and the delays in law enforcement bodies conducting investigations. The introduction of regulation could minimise the potential for the use of crypto-currencies for illegal purposes.

#### 1.4.5: Case Study E: Silk Road 2.0 (Exchange)

In November 2014, an international raid across 16 European countries and the USA, was undertaken to shut down Silk Road 2.0 and 400 other websites believed to be trading illegal items.<sup>141</sup> The sites were operated on the TOR network in a similar vein to the original Silk Road in order to provide anonymity to users. Large numbers of bitcoins were seized and with the operation still ongoing further websites are expected to be shut down as the investigation progresses.<sup>142</sup> Again the lack of adequate regulation or any regulation in many jurisdictions enables criminals to utilise crypto-currencies and exchanges for illegal and illicit purposes.

#### 1.4.6: Case Study F: Ripple (crypto-currency)

As noted, the majority of altcoins are developed using the principles of Bitcoins with minor adaptations. Recent developments have focused on an alternative implementation of the Blockchain proposing a federated digital currency accessed via a known and trusted “gateway.” This removes the decentralised nature apparent in bitcoin and other crypto-currencies.<sup>143</sup>

The protocol<sup>144</sup> provides the technology for real-time cross-border payments and settlement including in its currency. This hybrid model is increasing in popularity generally attributed to the centralised, federated nature of the crypto-currency. However, this innovation resulted in Ripple recently being fined by the US Federal Financial Crimes Enforcement Network [FinCEN] for breaching banking laws. FinCEN claims violations of the Bank Secrecy Act as a result of failures to register as a money services business and implement appropriate anti-money laundering procedures.<sup>145</sup> Ripple contend they did not wilfully participate in criminal

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<sup>140</sup> Joseph Cook, *Bitcoins: Technological Innovation or Emerging Threat?*, 30J. Marshall J. Info. Tech. & Privacy L. 535 - 570 (2014) p558.

<sup>141</sup> Jane Wakefield, *Huge raid to shut down 400-plus dark net sites* (BBC, London, 7 November 2014) <<http://www.bbc.co.uk/news/technology-29950946>> accessed 11 July 2015.

<sup>142</sup> BBC Author, *US police arrest Silk Road 2.0 suspect in Seattle*, (BBC, London, 21 January 2015) <<http://www.bbc.co.uk/news/technology-30913709>> accessed 11 July 2015.

<sup>143</sup> <[https://ripple.com/knowledge\\_categories/ripple-protocols/](https://ripple.com/knowledge_categories/ripple-protocols/)> accessed 11 July 2015.

<sup>144</sup> <[https://ripple.com/knowledge\\_categories/ripple-protocols/](https://ripple.com/knowledge_categories/ripple-protocols/)> accessed 11 July 2015.

<sup>145</sup> Stan Higgins, *FinCEN fines Ripples labs for Bank Secrecy Act Violations*, (Coindesk, USA, 5 May 2015) <<http://www.coindesk.com/fincen-fines-ripple-labs-700000-bank-secrecy-act/>> accessed 11 July 2015.

activities but owing to the innovative practices of the service registration in these areas was overlooked.<sup>146</sup>

## 1.5: Conclusions

The foregoing examples indicate that crypto-currencies can become associated with organised crime<sup>147</sup> but also suggests that crypto-currencies are not at present replacing nor actively competing with fiat currencies in relation to the volume of transactions. Although crypto-currencies, particularly bitcoin, have experienced a significant rise in popularity there is a continuing reluctance for individuals and retailers to adopt the use of crypto-currencies. Without appropriate regulation organised criminals will continue to utilise platforms and exchanges for laundering the proceeds of crime. If exchanges and platforms continue to be utilised in such a fashion without appropriate investor protection crypto-currencies are unlikely to gain worldwide acceptance. Regulation of exchanges is patently required for more users to trust and invest in crypto-currencies.

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<sup>146</sup> Stan Higgins, *FinCEN fines Ripples labs for Bank Secrecy Act Violations*, (Coindesk, USA, 5 May 2015) <<http://www.coindesk.com/fincen-fines-ripple-labs-700000-bank-secrecy-act/>> accessed 11 July 2015.

<sup>147</sup> Organised crime can be defined as serious crime planned, coordinated and conducted by people working together on a continuing basis. Their motivation is often, but not always, financial gain. National Crime Agency available at <<http://www.nationalcrimeagency.gov.uk/crime-threats/organised-crime-groups>> accessed on 11 July 2015.

## Chapter 2: Money

### 2.1: Functions

This chapter will examine the functions of money in contemporary society from both legal and economic perspectives. These functions will then be explored in relation to crypto-currencies with a view to establishing whether crypto-currencies can or should be classed as money. The danger of adopting a definitional approach without consideration of practical application is that where a disruptive product appears that product may fail to satisfy a definitional approach and yet perform the substantive function of the product with which the disrupter is intended to compete. As already examined,<sup>148</sup> crypto-currencies are increasingly exchanged for fiat currencies, deposited with exchanges and used as a method of payment for goods and services. Such usage suggests equivalent use to “money” and fiat currency. The European Banking Authority [EBA] recently acknowledged that crypto-currencies “....could potentially fulfil one or more of the functions of money.”<sup>149</sup> However, given the lack of governance by a central authority these functions are limited to the community who believe and trust in the specific networks.

To analyse the appropriateness, or otherwise, of classifying crypto-currencies as money and the resultant impact on the regulatory framework an examination of the constituent functions of “money” is required. This will enable consideration of the accuracy of the EBA’s statement that crypto-currencies are at present not money but could nonetheless fulfil some monetary functions. This chapter will consider public perception and thereafter assess the legal and economic components of money to analyse their existence in crypto-currencies. Thereafter *Chapter 3 (Payment)* will consider the use of crypto-currencies as a method of payment for goods and services before examining the current regulatory framework and the ability to adapt this framework to govern the use of crypto-currencies in *Chapter 5 (Regulation)*.

#### 2.1.1: Public Perception

While economic and legal perspectives are fundamental for appraising the components of money, it is also important to consider public perceptions and how money is used in contemporary society. This will enable consideration of whether the properties of money can also be applied to crypto-currencies.

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<sup>148</sup> In *Chapter 1 (Crypto-currencies)* at 1.1 (*The concept*).

<sup>149</sup> European Banking Authority, *Opinion on Virtual Currencies* (2014) <<http://www.eba.europa.eu/documents/10180/657547/EBA-Op-2014-08+Opinion+on+Virtual+Currencies.pdf>> at p12, accessed 11 July 2015.



The widely acknowledged characteristics of money include (i) having money to buy goods e.g. food, clothes, property, cars; (ii) being in a position to exchange money for services e.g. transport and entertainment; (iii) money as the method of return for undertaking work; (iv) or simply having savings or “money in the bank.” This final component is a common misconception. Owing to the importance of this presumption and alignment with the deposit services of exchanges this proposition requires clarification.

### 2.1.1.1: *Foley v Hill*

The relationship between the bank, customer and savings is long established in English law as a result of the decision in *Foley v Hill*.<sup>150</sup> Once money is paid into or transferred to a bank the depositor no longer owns or has possession of the cash/notes/coins. Traditional, tangible money is a corporeal moveable where possession provides ownership. This is transferred by the handing over of notes or coins (*traditio*). Contemporary usage<sup>151</sup> has extended the popular conception of money to payment and transfer electronically through direct debits, Bankers Automated Clearing System [BACS] payments, Clearing Houses Automated Payment System [CHAPS] and Faster Payments,<sup>152</sup> without the requirement of physical possession of money. Thus, possession of a corporeal moveable is no longer required to prove ownership nor necessary to transfer funds or money. In *Foley*, Lord Lyndhurst held that, “...*money, when paid into a bank, ceases altogether to be the money of the principal; it is then the money of the banker, who is bound to return an equivalent by paying a similar sum to that deposited with him when he is asked for it.*”<sup>153</sup> The individual’s ownership rights are extinguished upon *traditio* of the money to the bank and a personal right comes into being where the individual can require the bank to account for the equivalent value on demand.<sup>154</sup> The individual thus becomes a creditor<sup>155</sup> of the bank and holds a personal right<sup>156</sup> to be repaid the amount in

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<sup>150</sup> (1848) II House of Lords Cases (Clark’s) 28. This case develops the earlier decision in *Carr v Carr* (1811) 1 Mer 541.

<sup>151</sup> Michael McLeay, Amar Radia and Thomas Ryland, Money in the modern economy: an introduction, Quarterly Bulletin 2014 Volume 54, Q1 2014 at p9.  
<<http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q1.pdf>> accessed 11 July 2015.

<sup>152</sup> These are all common banking terms for means of transferring fiat currencies and are taken as understood for the purposes of this thesis. There are a number of cases detailing the precise requirements of each, including when the payments are made, what constitutes faster payment or direct debit. This thesis does not require such detailed analysis but payment is considered further in *Chapter 3 (Payment)*. However, it is recommended a general banking textbook e.g. Crerar is consulted.

<sup>153</sup> (1848) II House of Lords Cases (Clark’s) 28 at 36.

<sup>154</sup> such other terms as have been agreed by the parties as a term of the contract. For example where the deposit is for a fixed term of one year the depositor cannot demand “repayment” until expiry of the term.

<sup>155</sup> The etymology of creditor can be traced to the latin credo – “I believe” which chimes with the first paragraph of this chapter.

<sup>156</sup> Or chattel in the terminology of English law. It is at times expressed in the case law formerly as a chose in action and more recently as a thing in action.

account upon demand. This contractual right to be repaid will only be discharged by the bank through payment to the individual upon presentation of a passbook or its equivalent<sup>157</sup> and in accordance with the terms and conditions of the account.<sup>158</sup> Should the bank become insolvent the customer becomes an unsecured creditor.<sup>159</sup> Transfer of ownership of money to the bank accordingly differs from the public perception of continuing to *own* money in the bank account.

### 2.1.1.2 *Royal Bank of Scotland v Skinner*

Scots law reflects the rule established in *Foley*. Lord MacKay examined the relationship between bank, customer and savings in *Royal Bank of Scotland v Skinner*<sup>160</sup> holding that “.....after some fluctuation of opinion, it is now well settled that the relationship of customer and banker is.....a simple relation – it may be one sided, or it may be two-sided – of creditor – debtor. The banker is not, in the general case, the custodian of the money. When money is paid in, despite the popular belief, it is simply consumed by the banker, who gives an obligation of an equivalent amount.”<sup>161</sup> This long standing position has more recently been reaffirmed in *North Lanarkshire Council v Crossan*.<sup>162</sup>

## 2.2: Deposit

As examined,<sup>163</sup> exchanges primarily serve three functions: (a) as a platform for exchanging fiat currencies to crypto-currencies and vice versa – a similar function to that undertaken by a bureaux du change;<sup>164</sup> (b) as a store of crypto-currencies and therefore of value for individuals with an online wallet with the relevant exchange; and (c) as a platform for transferring crypto-currencies for payment. This section will assess exchanges and whether the use of “online wallets” or “online vaults” is akin to a banking relationship between bank and customer of accepting deposits, or the exchange is acting as custodian of the crypto-currencies deposited or if the relationship should be equated with a civilian concept of *depositum*. The following chapters will continue to analyse specific exchange terms and conditions and the protections afforded to consumers through indigenous UK legislation and European measures.

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<sup>157</sup> Or nowadays, a bank card or an over the counter transaction at the bank.

<sup>158</sup> Lorne Crerar, *The Law of Banking in Scotland*, (2<sup>nd</sup> Edition, Totel Publishing 2007) at p202.

<sup>159</sup> Lorne Crerar, *The Law of Banking in Scotland*, (2<sup>nd</sup> Edition, Totel Publishing 2007) at p190.

<sup>160</sup> 1931 SLT 382.

<sup>161</sup> 1931 SLT 382 at 384.

<sup>162</sup> 2007 S.L.T. (Sh Ct) 169 although the Sheriff Principal countenanced earmarking of funds in suitable cases.

<sup>163</sup> In *Chapter 1 (Crypto-currencies)* at 1.2 (*Operation*).

<sup>164</sup> See later regarding regulation of bureaux de change under customer due diligence requirements of Money Laundering.



### 2.2.1: *Depositum*

It is possible that the decisions in *Royal Bank of Scotland v Skinner*<sup>165</sup> and *Foley v Hill*<sup>166</sup> might, by extension, be applied to crypto-currencies.<sup>167</sup> Thus, an individual will no longer own the crypto-currencies deposited with the exchange but have a contractual relationship conferring a personal right with the relevant exchange for repayment upon demand. However, the relationship between the individual and exchange is unclear and requires further analysis.

The acceptance of deposits in “hosted wallets” or “online vaults”<sup>168</sup> by exchanges<sup>169</sup> may amount to the exchange acting as a custodian of the crypto-currencies and constitute the civilian contract of *depositum*. Further consideration of this proposition is required. Justinian states “*the obligation incurred by a person with whom a thing is deposited for custody is real, and he can be sued by the action of the deposit; he too being responsible for the restoration of the identical thing deposited, though only where it is lost through some positive act of commission on his part: for carelessness, that is to say, inattention and negligence he is not liable.*”<sup>170</sup> This suggests that individuals depositing sums with exchanges would have a common law claim against the exchange for repayment where the sums were lost through some positive action by the exchange. However, as examined<sup>171</sup> the majority of losses suffered by exchanges are as a result of alleged third party theft or technological faults and are not through a positive act of negligence or otherwise by the exchange.<sup>172</sup> Gaus also opined that an individual would not be liable where funds are misappropriated through fraudulent acts, even if such loss through theft is the result of negligence or carelessness by the individual, “.....but as he with whom property is deposited for safe keeping is only responsible where he has committed fraud in like manner, if the property should be stolen from him, for the reason that he is not required to make restitution by the action of deposit he is not, on that account, interested in its being preserved; hence he cannot bring the action of

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<sup>165</sup> 1931 SLT 382.

<sup>166</sup> (1848) 11 House of Lords Cases (Clark’s) 28. This case develops the *ratio decidendi* of the earlier decision in *Carr v Carr* 1811 1 Mer 541.

<sup>167</sup> As already discussed above at 2.1.1.1 (*Foley v Hill*) and 2.1.1.2 (*Royal Bank of Scotland v Skinner*).

<sup>168</sup> These terms are commonly used to reference the funds individuals hold online with the crypto-currency exchanges. Hosted wallets are established when registering with the crypto-currency exchange. For example <https://blockchain.info/wallet> or <https://www.coinbase.com/>. Both websites enable a user to create an online wallet without any identifying information other than an e-mail address.

<sup>169</sup> The terms and conditions of the relevant exchanges will be analysed further in *Chapter 4 (Consumer Protection)*.

<sup>170</sup> The Institutes of Justinian, 2.XIV.3.

<sup>171</sup> See *Chapter 1 (Crypto-currencies)* at 1.4 (*Case Studies*).

<sup>172</sup> Note the assessment in *Chapter 1 (Crypto-currencies)* where exchanges have been subject to *alleged* hacking. Even if the actions are, as is now suspected internal embezzlement, these are not owing to the negligence of the exchanges as there is, as yet, no proof of internal embezzlement.

*theft, but this action will lie in favour of the owner.*<sup>173</sup> Finally, Justinian confirms that “as a depositary is not answerable for safe keeping of the thing deposited, but only for fraud, and, if it is stolen, is not compellable to make restitution by action of deposit, he has no interest if it is lost, and therefore the action of theft is maintainable only by the depositor.”<sup>174</sup> Applying the Roman jurists it can be concluded that under the civilian contract an individual would have a claim for loss only where such loss is the result of a positive action by the exchange. This is not sufficiently broad to cover the alleged hacks encountered by exchanges and affords limited protection to consumers. The following section will consider whether exchanges are acting in the capacity of a custodian, holding funds for the underlying consumer, only to be returned.

### 2.2.2: Custodianship

The application of the principles of custodianship require the same item deposited to be returned. The question may be posed whether crypto-currencies are subject to these rules or whether they are fungible. Crypto-currencies do not have a serial number that can be traced through the Blockchain to ensure the same crypto-currencies are paid out as were paid in. Therefore crypto-currencies are not unique and are inherently fungible. Thus, there is no obligation on the exchange to pay out the same crypto-currency unit, such as a bitcoin, as paid into the hosted wallet. As crypto-currencies are fungible, the obligation placed upon the exchange is to return the value of the crypto-currency rather than a specific unit of a crypto-currency.<sup>175</sup> The individual thus has a personal right to bring an action for payment by the exchange rather than a right to demand delivery from the exchange as custodian. This confirms that exchanges are not acting in a custodial relationship with the consumer. Accordingly the contract with an exchange is not one of *depositum*. This is explored further in the next paragraph.

The real contract of *depositum* requires *traditio*, the physical handing over of a corporeal moveable. As crypto-currencies involve incorporeal moveables the concept of *depositum* would require a considerable conceptual expansion in order to be applicable. However, the absence of a corporeal moveable is not an end to the possibility of retaining a real right in the hands of the consumer. An examination of other real rights may provide a useful analogy. In property transactions relating to immovable property, the property was physically passed to a new owner with the ceremonial passing of soil and in later practice the recording of the event in the attending notary's protocol book and subsequently by the public act of recording that instrument in the sasine register, then by direct recording of the transfer itself in that register

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<sup>173</sup> The Institutes of Gaius, Third Book, 207.

<sup>174</sup> The Institutes of Justinian, 4.I.17.

<sup>175</sup> See previous discussion on *Foley v Hill*.

and latterly in the land register.<sup>176</sup> The recording of the deed in the sasine register or the land register was the equivalent to *traditio*. Similarly, in relation to incorporeal rights they may be transferred by assignation which is a private transaction between the parties plus intimation to the third party which is the equivalent of the public act, and to *traditio* and the physical handing over of property.<sup>177</sup> Taking this proposition and applying to the use of exchanges - an individual deposits funds in a hosted wallet which is transferred by the exchange to the equivalent, at the current exchange rate, of crypto-currency. The purchase of the crypto-currency is by the exchange on behalf of the individual depositing funds in hosted wallets. Such a purchase transaction is recorded on the Blockchain, but owing to the fundamental principles<sup>178</sup> of the Blockchain the transaction is not ascribed to an identifiable individual and remains anonymous, other than reference to the transaction having occurred. As noted above crypto-currencies are fungible, so the purchase to the individual's "online account" need not be the same crypto-currencies but can come from a communal fund of crypto-currencies. The oxymoron of the "anonymity of the public announcement" transferring ownership results in the transfer neither constituting a clear assignation nor public intimation of the transfer of crypto-currencies from one user to another. Therefore the "depositing" of funds into hosted wallets is not comparable to the *depositum* real right as there is no identifiable assignation nor intimation of the transfer to the individual's hosted wallet or online account. The exchanges are holding funds on behalf of individuals, which may be considered a fiduciary relationship – the case law regarding implied and contractual trusts arising from such relationships and its application to the governance of crypto-currencies will be assessed in the following paragraphs.

### 2.2.3: Implied Trust<sup>179</sup>

In *Devron Potatoes v Gordon & Innes Limited*<sup>180</sup> the Outer House of the Court of Session considered the situation of an implied trust in relation to a bank holding funds which were apparently earmarked or labelled to identify the interests of third parties in Scotland. A cooperative of potato growers, brought an action for payment against their former marketing agents and their receivers following on from the marketing agents' insolvency. The cooperative of potato growers also raised an action against the agents' bank. The marketing agents had established a general "growers' account" in their name with their bank solely for deposits held

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<sup>176</sup> For further information see George Gretton and Kenneth Reid, *Conveyancing*, (4<sup>th</sup> Edition, W. Green, London, 2011) and David Brand, Andrew Steven and Scott Wortley, *Professor McDonald's Conveyancing Manual*, (7<sup>th</sup> Edition, Tottel Publishing, London, 2004).

<sup>177</sup> For assignation generally see: Ross Anderson, *Assignation*, (Avizandum Publishing Limited, Edinburgh, 2008).

<sup>178</sup> Further analysis of this concept is detailed in *Chapter 1 (Crypto-Currencies)* at 1.2 (*Operation*).

<sup>179</sup> Express trust will be considered later in this chapter.

<sup>180</sup> *Devron Potatoes Ltd v Gordon & Innes Limited* 2003 SCLR 103; 2002 GWD 34 – 1162.

on behalf of the pursuers and other potato growers. This might have been thought sufficient to earmark the funds as segregated from the agents' own funds. However, on receivership of the marketing agent the court held the monies were not held separately from the marketing agents' general funds and were available to be set off against debts due by the agents to the bank. This demonstrates the reluctance of the courts to imply obligations of trust even where the original parties had created the arrangement to offer comfort to the growers that the funds were in fact segregated. This can be applied to the situation where an exchange holds funds on behalf of the individuals, aware that the funds are the individual's and not the exchange's. Upon failure of the exchange, it appears the funds of the individuals will not be separated from the exchange but considered part of the exchange's funds and liable to set-off against the exchange's own obligations. While *Devron Potatoes* is an Outer House case a further example from the Inner House can be found in *Style Financial Services Limited v Bank of Scotland (No 2)*<sup>181</sup> concerning the holding of payments by a third party. Individuals were provided with finance and could repay directly to the finance party or Goldberg ("G"), an associated company, in cash or cheque. The finance company and G had agreed that G would credit those sums to the finance company on an ongoing basis. G suffered financial problems and the money held for the finance company was applied by the bank to discharge the debt, even though the bank was aware the funds were being held for the finance company. The court held that the written agreements between G and the finance company did not create an express trust over the funds collected by G and no trust was created, and in the circumstances no express declaration of trust was otherwise created. The relationship between G and the finance company was that of debtor and creditor. It is likely that the courts will apply this principle to funds held in exchanges, the result would be a loss to the underlying individuals. Therefore the individuals would not be entitled to recover funds under implied trust, and certainly the contractual documentation<sup>182</sup> does not amount to the creation of a legal trust, as the exchange is not acting as an agent on behalf of the individuals who have deposited sums with the exchange. This aligns with the debtor-creditor relationship discussed above in *Foley*.

In contrast the decision in *Bank of Scotland v A Ltd*<sup>183</sup> suggests that in England banks may in certain circumstances find themselves being successfully found to hold funds for the benefit of third parties and not their customer as a result of the operation of equitable principles. This

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<sup>181</sup> 1998 SLT 851.

<sup>182</sup> See Appendix 2 (*Terms and Conditions*).

<sup>183</sup> [2001] EWCA Civ 52.

may explain in part the reluctance of banks to offer services to exchanges<sup>184</sup> along with difficulties of confirming the source of funds - a requisite of money laundering regulations.<sup>185</sup>

As the depositing of crypto-currencies with exchanges is neither a custodial relationship, the *depositum* civilian contract nor an implied trust, then should the exchange experience financial problems individuals will only have a personal right against the exchanges for loss of crypto-currencies deposited therein, ranking after any secured lenders, unless the terms and conditions of the exchange can be considered constituting an express trust. As was seen with banks in 2008, this renders those using exchanges peculiarly vulnerable to their failure.

#### 2.2.4: Express Trust

Even if there is no room to imply a trust from the relationship of an exchange with its customers that does not preclude the creation of an express trust through the terms and conditions of the contract between an exchange and its customers. Having undertaken a review of the terms and conditions of a number of exchanges,<sup>186</sup> no contractual trust for accepting deposit of the funds is created.<sup>187</sup> This question of the creation of an express trust as a term of a contract in Scots law was considered in *Clark Taylor v Quality Site Development (Edinburgh) Ltd.*<sup>188</sup> Lord President Emslie clearly detailed the requirements for a trust – including the requirement for appropriation of property to trust purposes. Effectively, the real right in the property required to be transferred and qualified by the trust purposes. The Lord President also distinguished an obligation to create a trust in the future (a personal obligation) from the actual creation of the trust by investing the trustee with a real right in actual property and not future property. Thus, segregation from the trustee's own funds by the appropriation to the trust purposes with suitable labelling is required in Scots law. It is evident from the terms and conditions examined that neither party envisages the creation of an express trust and therefore no further consideration of this proposition is required.

In English law in contrast, a trust exists as a result of the acceptance of both legal and equitable estates existing in the same property at once. Furthermore trust assets need not be labelled in the title to the assets. If they become mixed, for example in an online wallet then the doctrine of tracing will be of application. The ability to trace the mixed assets was

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<sup>184</sup> Daniel Palmer, *Safello Partners with UK Bank for Faster Payments*, (CoinDesk, USA, 15 December 2014) <<http://www.coindesk.com/safello-partners-uk-bank-faster-bitcoin-payments/>> accessed 11 July 2015.

<sup>185</sup> Regulation 8 of Money Laundering Regulations SI 2007/2157.

<sup>186</sup> ANXBTC <<https://anxbtc.com/>> accessed 11 July 2015; Bitstamp Limited <<https://www.bitstamp.net/>> accessed 11 July 2015; Bitcoin Trading <<https://btc.sx/>> accessed 11 July 2015. See *Appendix 2 (Terms and Conditions)* for further information.

<sup>187</sup> The terms and conditions are further analysed in *Chapter 4 (Consumer Protection)*.

<sup>188</sup> *Clark Taylor & Co. Ltd. v Quality Site Development (Edinburgh) Ltd* 1981 SLT 308, see also *Balfour Beatty Ltd v Britannia Life Ltd* 1997 SLT 10.

considered by Fox LJ in *Agip (Africa) Ltd v Jackson*<sup>189</sup> who stated that “equity .... will follow money into a mixed fund.” This can be considered applicable in light of deposits into online wallets where a fiduciary relationship exists. This could therefore give rise to the equitable right in property under English law.

### 2.3: Economists’ Perspectives

The economists’ perspective of money and its usage requires explored to assess whether crypto-currencies are being used as a traditional form of money.

Firstly, modern economists, such as Hicks, generally follow Adam Smith’s analysis<sup>190</sup> and define money through the functions it performs:<sup>191</sup>

- (i) medium of exchange;
- (ii) measure of value or a standard for contractual obligations;
- (iii) store of value or wealth; and
- (iv) unit of account.

Adam Smith,<sup>192</sup> the founding father of modern economics, analysed the development and application of money in accordance with these four functions. This influential work is still considered the cornerstone of modern economics and many modern economists still rely on Adam Smith’s analysis and conclusions. Latterly, John Maynard Keynes built upon Smith’s philosophies and the key elements of the use of money. This section is reliant on the works of these key economists in assisting in the explanation of the progression and application of economic theory in society. However, it must be made clear that owing to the plethora of information produced by economists this section aims to consider each function in some, but by no means minute, detail as the majority of the economic analysis is outwith the scope of this thesis.

Thus, Eastwell, Milgate and Newman propose “*money is still best defined in the classical tradition to refer to any object generally accepted and used as a medium of exchange.*”<sup>193</sup> Anything constitutes money which is acceptable as a medium of exchanges. Lawyers discount this definition as too expansive instead confining the definition of money to the context in which

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<sup>189</sup> *Agip (Africa) Ltd v Jackson* [1991] Ch. 547 at 566

<sup>190</sup> Adam Smith, *The wealth of nations* [1776].na, 1937.

<sup>191</sup> As quoted by Paul Davidson, *Money in the real world The Economic Journal*, Vol. 82, No. 325 (Mar., 1972), pp. 101-115 at p101.

<sup>192</sup> Adam Smith, *The wealth of nations* [1776].na, 1937 at p126 onwards.

<sup>193</sup> Eatwell, Milgate and Newman (eds) *The New Palgrave Money*, W.W Norton & Co 1989 at 263.

it is used. These differing opinions will be key in assessing whether crypto-currencies constitute money and will directly impact on the applicable legislation.<sup>194</sup>

### 2.3.1: Medium of Exchange

At a basic level, economists propose that money must be a common medium of exchange,<sup>195</sup> i.e. something held because individuals plan to trade or swap it for another item. Smith<sup>196</sup> viewed money as an essential part of moving from a subsistence economy, or autarky, to an exchange economy. In a subsistence economy, everyone consumed only what they produce. As Smith explains<sup>197</sup> it is more efficient and economic for people to specialise in producing greater amounts of one good than they need themselves and trading or exchanging for other items. This development depicts progression of society into an exchange society with individuals actively exchanging goods with one another.<sup>198</sup>

It is worthwhile devoting particular attention to Smith's analysis<sup>199</sup> in order to develop a working hypothesis of the development from the basic exchange economy and into increasingly expansive trading. In the UK, cattle began to be used as a common factor in ascertaining the *value* of exchange for goods i.e. one cow equated to 10 bags of grain. The crudest interpretation considers cattle as an early form of commodity money, being the measure of value and common factor in exchange – a characteristic not dissimilar to crypto-currencies. Smith<sup>200</sup> provides some further examples of commodity money.<sup>201</sup> Use of cattle can be viewed as an early stage of exchange of commodity money i.e. when non-financial assets serve some of the functions of money. Use of commodities, which in themselves hold value, provide a level of confidence that they can be exchanged for other goods in the future. As society developed the barter economy and cattle exchanges were no longer practicable and people began to utilise other methods of exchange. Commodities such as gold and silver retained their value, were not perishable and there was a limited quantity available which, if not quite finite, was not readily added to. Thus, gold and silver began to be considered as more

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<sup>194</sup> Refer to *Chapter 5 (Regulation)* for further information.

<sup>195</sup> Eatwell, Milgate and Newman (eds) *The New Palgrave Money*, W.W Norton & Co 1989 at 263.

<sup>196</sup> Adam Smith, *The wealth of nations* [1776].na, 1937 at p127 - 131.

<sup>197</sup> Adam Smith, *The wealth of nations* [1776].na, 1937 at p126- 127.

<sup>198</sup> Michael McLeay, Amar Radia and Thomas Ryland, Money in the modern economy: an introduction, Quarterly Bulletin 2014 Volume 54, Q1 2014, <<http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q1.pdf>> accessed 24 May 2015.

<sup>199</sup> Adam Smith, *The wealth of nations* [1776].na, 1937 at p127.

<sup>200</sup> Adam Smith. *The wealth of nations* [1776].na, 1937 at p127.

<sup>201</sup> In other countries where other universally accepted commodity measures of value included: sugar in West Indies colonies, dried cod in Newfoundland or tobacco in Virginia.

appropriate common trading mechanisms.<sup>202</sup> The development continued and led to the institution of coins, of which the stamp covering entirely both sides of the piece, was to demonstrate the weight and fineness of the metal and was used as a means of exchange in society. Initially, the lack of checks on the quality of the metal resulted in issues of trust in coins until universal acceptance was achieved. Latterly, the central development of coins and notes addressed this lack of trust. Nowadays the use of coins and notes as a means of exchange has resulted in the transfer of an item representing a nominal value – the value of the notes and coins is depicted on the items and is representative of the amount rather than constituting the amount. The universality of money and common trust result in universal acceptance of money as a means of exchange. The lack of these elements in crypto-currencies is immediately key in determining whether crypto-currencies ought to be considered as money. At best, crypto-currencies may have presently attained the status of a type of commodity money within, what remains at the time of writing, a restricted community of acceptance.

As the number of worldwide retailers accepting crypto-currencies as a means of exchange increases, application of the above analysis as to whether the use of crypto-currencies as a medium of exchange constitute money must be considered. One of the leading analysts of crypto-currencies, Blockchain,<sup>203</sup> estimate that there were approximately 110,000 transactions per day on the bitcoin network in May 2015<sup>204</sup> and Coindesk estimate that approximately 100,000 merchants accepted crypto-currencies in 2014.<sup>205</sup> The number of bitcoin transactions has experienced a steady increase from creation in 2009 until November 2014. Wikipedia<sup>206</sup> and Mozilla<sup>207</sup> accept donations in bitcoin, Microsoft<sup>208</sup> accept payment by bitcoin while Google can calculate crypto-currency to fiat currency conversion rates.<sup>209</sup> While acceptance is becoming increasingly mainstream this does not give a clear indication as to how widely the facility is actually used by customers to purchase goods and services. To assess usage as a means of exchange the activity of hosted wallets requires analysis. Coindesk estimated that

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<sup>202</sup> Interestingly, this movement from cattle exchange to the use and exchange of money can be found in the Latin *pecunia* for money which is literally translated as the little cattle (*pecus*).

<sup>203</sup> Blockchain Information <<https://blockchain.info/>> accessed 11 July 2015.

<sup>204</sup> Taking a rolling average per 7 days <<https://blockchain.info/charts/n-transactions>> accessed 11 July 2015.

<sup>205</sup> Coindesk Author, *State of Bitcoin Q2 2014 Report Reveals Expanding Bitcoin Economy* (Coindesk, USA, 10 July 2014) <<http://www.coindesk.com/state-of-bitcoin-q2-2014-report-expanding-bitcoin-economy/>> accessed 11 July 2015.

<sup>206</sup> Stan Higgins, *Wikipedia Raises \$140K in First Week of Bitcoin Donations*, (Coindesk, USA, 7 August 2014) <<http://www.coindesk.com/wikipedia-raises-140000-first-week-bitcoin-donations/>> accessed 11 July 2015.

<sup>207</sup> Donations to Mozilla <<https://sendto.mozilla.org/page/content/give-bitcoin/>> accessed 11 July 2015.

<sup>208</sup> BBC Author, *Microsoft to accept payments made in bitcons* (BBC, London, 11 December 2014) <<http://www.bbc.co.uk/news/technology-30377654>> accessed 11 July 2015.

<sup>209</sup> <[www.google.co.uk/#q=bitcoin+converter](http://www.google.co.uk/#q=bitcoin+converter)> 1 Bitcoin equals: 189.98 British Pound Sterling accessed 11 July 2015.



there were over 5 million wallets trading crypto-currencies in June 2014.<sup>210</sup> In undertaking the analysis Coindesk acknowledged that many individuals may have double wallets, or no longer use “empty” wallets. The number of duplications or wallets no longer in use has not been quantified, but the 5 million wallets can be considered a significant over-estimate. Bank of England Reports also analysed wallet activity concluding that “*so far in 2014, there have been, on average, fewer than 0.02 transactions per day for wallets held with “My Wallet” (roughly one transaction per day for every 65 wallets).*”<sup>211</sup> It is suggested that these statistics demonstrate that individuals may have dabbled in crypto-currencies but are no longer actively participating in the use as a means of exchange for goods, services or other crypto-currencies and confirming both Coindesk’s statement that there may be double or empty wallets and the earlier conclusions that individuals are purchasing crypto-currencies for long term speculative investment purposes.

While these figures demonstrate that the popularity of crypto-currencies is increasing they also confirm that as yet the transaction numbers fall far short of fiat currencies. This suggests crypto-currencies require a significantly higher adoption rate amongst the public at large to gain the universal trust required to be accepted worldwide as a means of exchange. The existence of the other components traditionally associated with money will now be examined to continue with the consideration of what crypto-currencies should be classified.

### **2.3.2: Measures of Value or as a Standard for Contractual Obligations**

Smith<sup>212</sup> discussed the rate at which goods or units may be exchanged for another and how the value of exchange can be ascertained. In the abstract, Smith distinguished between the “usefulness” of the goods to be acquired and the “cost incurred” in creating the goods i.e. by deducting or taking into account the costs incurred in production a value in use can be ascertained. Secondly, Smith continued by explaining the means by which we value a total stock of goods created by an individual and used in exchange for others i.e. the “value in exchange.” This value in exchange is dependent on a multitude of factors including availability of products (demand and supply) and the production costs alongside competitors’ prices.

Smith explained that the items which have the greatest value in use frequently have little or no value in exchange; and those with the greatest value in exchange often little value in use.

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<sup>210</sup> Coindesk, *State of Bitcoin Q2 2014 Report Reveals Expanding Bitcoin Economy* (Coindesk, USA, 10 July 2014) <<http://www.coindesk.com/state-of-bitcoin-q2-2014-report-expanding-bitcoin-economy/>> accessed 11 July 2015.

<sup>211</sup> Robleh Ali, John Barrdear, Roger Clews and James Southgate “*The Economics of digital currencies*” (2014) Bank of England Quarterly Bulletin Q3 at page 5.

<sup>212</sup> Adam Smith *The wealth of nations* [1776].na, 1937 at p131.

To elucidate this proposition Smith<sup>213</sup> considered the examples of water and diamonds – nothing is more useful (and necessary) than water, but it will purchase scarce anything, whereas diamonds with limited value in use can be exchanged for a plethora of items.<sup>214</sup> Skinner considered the commonality is that both hold some value because they represent, albeit on distinctly different levels, a source of satisfaction to the individual.<sup>215</sup> Based on the foregoing analysis the function of usefulness is key to the definition of “value” of goods, yet usefulness could not be pinned on ascertaining a value of the goods.

Smith<sup>216</sup> introduced a further strand to his analysis stating that the rate at which an individual will exchange one good for another must be affected not only by the usefulness and scarcity of the goods to be acquired, but also by the “toil and trouble” involved in creating the goods exchanged. Smith's analysis<sup>217</sup> suggests that the real value of goods to be exchanged is expressed in terms of the amount of labour used to create those goods, in connection with the scarcity and usefulness of the goods. In modern society, labour is intrinsically linked to production costs and cannot be easily distinguished.

Applying these factors to crypto-currencies and the ability to measure the value in crypto-currencies is not an easy task. As discussed in the foregoing paragraph the “*toil and trouble*” in creating crypto-currencies is considerable and should in theory increase the value in exchange. However, balanced against the source of satisfaction to individuals and the uses of crypto-currencies this is difficult to quantify. Arguably crypto-currencies can only be considered a measure of value to those who trust and believe in the network. Crypto-currencies may be considered equivalent, by the limited community that are happy to recognise them, to diamonds in the above example; diamonds have limited value in use but can be exchanged for a plethora of items. Similarly, crypto-currencies have limited value in use but can be exchanged for a number of goods and services – as already discussed the limited means of exchange means crypto-currencies cannot yet be exchanged for a wide range of items. The intrinsic link between value in exchange and store of value will be examined further below.

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<sup>213</sup> Adam Smith *The wealth of nations* [1776].na, 1937 at p131 – 132.

<sup>214</sup> This analogy in the abstract, although from 1776 still stands true. The examples should be updated as in recent years there has been a change in attitude to water, which although still a natural and pure sourced at minimal cost now retails worldwide. Perhaps an analogy reflective of 2015 would be air is freely accessible and useful yet of little value when compared to diamonds.

<sup>215</sup> Andrew Skinner, an introduction to Adam Smith: The Wealth of Nations Books 1 – 3, An Introduction p48.

<sup>216</sup> Adam Smith *The wealth of nations* [1776].na, 1937 at p132.

<sup>217</sup> Adam Smith *The wealth of nations* [1776].na, 1937 at p132.

### 2.3.3: Store of Value

The third function of money is as a store of value i.e. money can be saved, retrieved and exchanged at a later time for a reasonably predictable value or predictable usefulness. Economic theory asserts that in a free market economy market price represents the interaction between supply and demand. Price is set to equate the quantity being supplied and that being demanded. The law of price dictates that where the same product is being offered for sale at multiple locations the cost differential should not be greater than representing shipping, taxes, distribution and other affiliated costs. Thus, the price of commodities should always remain in a price differential with only slight variations amongst retailers representing variations in shipping or distribution and the seller's desired profit margin.<sup>218</sup> Application of the price theory in accordance with the store of value will be applied to crypto-currencies in the following paragraphs.

Economists regularly debate the importance of the store of value function. Keynes<sup>219</sup> suggested that this function is no longer key as individuals wishing to receive returns for their finances are better placed investing in other products and services. However, modern economists, including Tobin, conclude that "*the crucial property of 'money' in this role is being a store of value*"<sup>220</sup> thereby reasserting its importance in the definition by function. Store of value has also been confirmed by Friedman<sup>221</sup> as an element of complete certainty as it is vital that an individual has the ability to store wealth, thus "*...money as such can take the form of any durable asset capable of performing the store-of-value function. Largely through this function money influences the cyclical behaviour of consumption, savings, investment and employment.*"<sup>222</sup> Predictability is key as many items increase or decrease in value and cannot be considered an asset with a reliable store of value.

In modern society money can fluctuate in value owing to a number of factors. For example, in the aftermath of the First World War in Germany the value of Weimar republic marks became a poor store of value owing to hyperinflation and foreign currency was used by some Germans

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<sup>218</sup> Owing to the breadth of analysis of price theory, this thesis has noted its importance is ascertaining price by retailers, however further discussion is outwith the scope of this thesis. See R.L. Hall and C.J. Hitch, *Price Theory and Business Behaviour*, Oxford Economic Papers (No. 2 (May 1939, pp12 – 45); Milton Friedman, *Price Theory*, Transaction Publications 2007; Edwin Mills, *Uncertainty and Price Theory*, The Quarterly Journal of Economics, Vol. 73, No 1 (Feb 1959) pp116 – 130.

<sup>219</sup> John Keynes, The Collected Writings of John Maynard Keynes, Volume V, A Treatise on Money in Two Volumes (1) The pure theory of money, 1971 version at p3.

<sup>220</sup> As quoted by Paul Davidson, *Money in the real world The Economic Journal*, Vol. 82, No. 325 (Mar., 1972), pp. 101-115 at p102.

<sup>221</sup> M Friedman, *A Monetary Theory of Nominal Income* Journal of Political Economy Vol. 78, 1970

<sup>222</sup> Kenneth K. Kurihara, *Monetary theory and public policy*. Routledge, 2013.

to purchase goods owing to their more predictable value.<sup>223</sup> A further example is the fluctuation in the value of the pound in the weeks preceding the Scottish independence referendum, with the pound hitting 10 month lows owing to the uncertainty of the outcome.<sup>224</sup> However, these incidents are unusual and the consistency and store of value in money by and large remains.

It appears that the degree of circulation with many crypto-currencies, including the most popular crypto-currency, bitcoin remains low.<sup>225</sup> The Blockchain figures<sup>226</sup> suggest that individuals could be retaining crypto-currencies as the store of value qualities are more valued than use as a means of exchange. An alternative interpretation may be that the lack of universal acceptance places limitations on use and therefore reduces the opportunities for consumer use. If retaining, individuals should be confident that crypto-currencies can be used for future supply and demand and certain about value retention. Yet, crypto-currencies are recognised for their volatility, exposing holders to losses and conversely significant gains as a result of fluctuations in exchange rates against fiat currency.<sup>227</sup> For example, the value of the most popular crypto-currency, Bitcoin, experienced a crash in value over New Year 2014 / 2015.<sup>228</sup> Academics suggest that holders of crypto-currencies are, to some extent, betting that future supply and demand will remain and crypto-currencies will be used as an increasingly common method of exchange.<sup>229</sup> Perhaps unsurprisingly given the lack of official oversight, the Bank of England warns that crypto-currencies appear to be poor short-term stores of value given the unpredictability in exchange against fiat currencies.<sup>230</sup> This was affirmed in a recent presentation at The World Bank – Global Forum of Law, Justice and Development<sup>231</sup> where

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<sup>223</sup> Robleh Ali, John Barrdear, Roger Clews and James Southgate *"The Economics of digital currencies"* (2014) Bank of England Quarterly Bulletin Q3 at p5.

<sup>224</sup> BBC Author, *Pound falls on fears of Scottish independence* (BBC, London 8 September 2014) <<http://www.bbc.co.uk/news/business-29103445>> accessed 11 July 2015.

<sup>225</sup> Robleh Ali, John Barrdear, Roger Clews and James Southgate *"The Economics of digital currencies"* (2014) Bank of England Quarterly Bulletin Q3 at p5.

<sup>226</sup> Robleh Ali, John Barrdear, Roger Clews and James Southgate *"The Economics of digital currencies"* (2014) Bank of England Quarterly Bulletin Q3 at p5.

<sup>227</sup> Alex Hern, *Bitcoin is the worst investment of 2014, but can it recover?* (The Guardian, London, 18 December 2014) <<http://www.theguardian.com/technology/2014/dec/17/why-bitcoin-is-the-worst-investment-2014>> accessed 11 July 2015. This article details the value of bitcoin dropping by 52% over the course of 2014 alone. It suggests this is a larger drop in value than the Russian Rouble which is currently "free falling." This demonstrates the volatility in the value of crypto-currencies and the bitcoin in particular. These findings question the ability of crypto-currencies to become a single accepted currency and whether crypto-currencies can actually be considered money or currency.

<sup>228</sup> Joon Ian Wong, *Markets Weekly: Bitcoin's New Year Starts with a Crash* (Coindesk, USA, 5 January 2015) <<http://www.coindesk.com/markets-weekly-bitcoins-new-year-starts-crash/>> accessed 11 July 2015.

<sup>229</sup> William Luther & Lawrence White, *Can Bitcoin Become a Major Currency?* 5 June 2014 <<http://ssrn.com/abstract=2446604>> accessed 11 July 2015.

<sup>230</sup> Robleh Ali, John Barrdear, Roger Clews and James Southgate *"The Economics of digital currencies"* (2014) Bank of England Quarterly Bulletin Q3 at p4.

<sup>231</sup> The World Bank – Global Forum of Law, Justice and Development. Washington DC 14 June 2013.

the European Central Bank's Iddo de Jong<sup>232</sup> proposed that crypto-currencies do not meet the characteristics of money and cannot be considered a store of value. Notwithstanding the conclusions of these influential bodies further opinions regarding the store of value capabilities must be analysed.

The number of google searches for "bitcoin" peaked in line with a peak in value of bitcoins.<sup>233</sup> If value is so closely linked to publicity then crypto-currencies may be considered a novelty. Comparison with Tulipmania in 17<sup>th</sup> Century Netherlands should be made as "...former US Federal Reserve Chairman Alan Greenspan, Nout Wellinck, a former President of the Dutch Central Bank, and Nobel Laureate economist Robert Shiller maintain that virtual currency is a passing fad or bubble, akin to Tulipmania in 17<sup>th</sup> Century Netherlands."<sup>234</sup> Tulipmania resulted in the contract price for tulips in early February 1637 reaching a level approximately 20 times higher than the price in November 1636 as a result of the use of futures contracts.<sup>235</sup> Thomson referred to a graph (reproduced in *Appendix 3: Price Fluctuations*) which is not dissimilar to the price fluctuations in the most common crypto-currency, bitcoins, also graphically represented in *Appendix 3: Price Fluctuations*. Such opinions question the long term viability of crypto-currencies and whether they can be considered a sustainable store of value. In addition the novelty of crypto-currencies means there is no evidence assessing the medium to long term store of value properties.

Finally, the application of price theory to crypto-currencies is not without difficulty. Each exchange acts as an Over The Counter [OTC] marketplace, which means there is no established market where traders directly trade the commodity and the price differential is not within a designated range; each exchange makes its own market, deciding on price and markup. As noted in the following chapters, actions by regulators in relation to the unregulated LIBOR market proceeded under a breach of the High Level Principles for Business [PRIN] block in the FCA handbook, in the absence of regulation specific to that market. At present neither crypto-currencies nor those operating OTC markets in the exchange of fiat currencies to and from crypto-currencies are regulated. So no action by the FCA based on the High Level Principles for Business would be applicable to those involved in such unregulated activities.

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<sup>232</sup> Market Integration Division, Presentation: Overview of virtual currency schemes 14 June 2013 <[http://globalforumljd.org/docs/events/061413/061413\\_ppt\\_ecb.pdf](http://globalforumljd.org/docs/events/061413/061413_ppt_ecb.pdf)> accessed 11 July 2015.

<sup>233</sup> Kash Mirhill, *Things I learned about bitcoin living on it a second time* Forbes (Forbes, USA, 15 May 2014) <<http://www.forbes.com/sites/kashmirhill/2014/05/15/21-things-i-learned-about-bitcoin-living-on-it-a-second-time/>> accessed 11 July 2015.

<sup>234</sup> The Financial Action Task Force (FATF) Report *Virtual Currencies: Key Definitions and Potential AML/CFT Risks*, June 2014.

<sup>235</sup> Earl Thomson, *The tulipmania: Fact or artefact?* 12 June 2006 <<http://www.econ.ucla.edu/thompson/document97.pdf>> accessed 11 July 2015.

Evaluation as a store of value and price theory is dependent on the evolution and sustainability of crypto-currencies in the medium to long term, future demand and supply, continued acceptance balanced against the finite nature of many crypto-currencies and the increasing alternative crypto-currencies available on the market. These factors will be considered in the following chapters.

### 2.3.4: Unit of Account

Keynes explained that money of account, that in which debts and prices and general purchasing power are expressed, is another key concept of the theory of money and a basis for further economic propositions.<sup>236</sup> He continued by noting that money itself, namely that by delivery of which debt, contracts and price contracts are discharged,<sup>237</sup> and in the shape of which a store of general purchasing power is held, derives its character from its relationship to the money of account, since the debts and prices must have been expressed in terms of the latter. Thus, money can only exist in relation to a money to account and is the thing which answers the description to money to account.<sup>238</sup> Thus, wheat, apples and t-shirts cannot be added together to calculate the gross national product of the country as they are all different commodities and have no common factor. However using money as the unit of account to calculate the value of these products creates a common factor and method of calculation which can be used to calculate the gross national product of a country. Although the nominal value of property, stocks, shares or bonds can increase or decrease the nominal value of a pound, euro or dollar remains the same, at least within the national state of the currency. The constancy of the nominal value of money is a consequence of the fact that money is itself a unit of account which defines the nominal value of any currency.

There is little evidence of any crypto-currency being used as a unit of account. Only a small number of transactions at present occur where the parties negotiate and agree a price in bitcoin.<sup>239</sup> By and large prices are non-negotiable exchange rates<sup>240</sup> and retailers regularly update the prices in accordance with fluctuation in exchange rates. Therefore it is clear that crypto-currencies do not meet this key economic function of money.

The foregoing economic analysis questions the use of crypto-currencies as money. Crypto-currencies meet the key objective of being used and accepted as a means of exchange.

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<sup>236</sup> Keynes, The Collected Writings of John Maynard Keynes, Volume V, A Treatise on Money in Two Volumes (1) The pure theory of money, 1971 version at p3

<sup>237</sup> Discussed generally in *Chapter 3 (Payment)*.

<sup>238</sup> Keynes, The Collected Writings of John Maynard Keynes, Volume V, A Treatise on Money in Two Volumes (1) The pure theory of money, 1971 version at p3.

<sup>239</sup> Robleh Ali, John Barrdear, Roger Clews and James Southgate “*The Economics of digital currencies*” (2014) Bank of England Quarterly Bulletin Q3 at p5.

<sup>240</sup> Google has a bitcoin converter.

However, the universality of such exchange, particularly in comparison with Faster Payments Schemes and cash such as Pounds Sterling usage, is still restricted to the network of users who trust the principles of the crypto-currency network. Lack of universal acceptance is key in the consideration of crypto-currencies as “money” and arguably the foregoing analysis suggests that crypto-currencies cannot be “money” for these purposes. Additionally, the ability of crypto-currencies to retain value is questionable. As noted, the volatility of crypto-currency value is at best a highly speculative investment and the absence of this important characteristic of stability implies that crypto-currencies cannot be considered money. The following section will examine the additional legal requirements in order for crypto-currencies to be considered as money.

## 2.4: Legal

The use of “money” features heavily in commercial contracts, the sale of land, property and goods, services and other legal obligations. Yet lawyers have struggled to provide a single all-embracing definition of money which can be applied across a range of legal scenarios. Scholars and courts alike argue the meaning of the term varies depending upon the context in which it is used and suggest that attempting to provide a definitive, universal and thereby restrictive definition of money may produce undesired effects. Goode asserted that *“much of the debate on what constitutes money in law is rather sterile and has few implications for the rights of parties to commercial transactions, where payment by bank transfer is the almost universal method of settlement.”*<sup>241</sup> Proctor admits that in the context of commercial and financial transactions, the notion of payment<sup>242</sup> is of more practical importance<sup>243</sup> than a definition of money explaining that *“the lawyer’s preoccupation with private and commercial rights and the performance of financial obligations tends to diminish the importance of ‘money’ as an independent legal concept, because the notion of payment usually plays a greater role in those cases in which a dispute does arise.”*<sup>244</sup> This preoccupation with the legal consequences of payment mechanisms has produced an abundance of case law on the concept of payment, its occurrence and implications<sup>245</sup> yet the courts have, on very few occasions, examined in any meaningful way the concept of money.<sup>246</sup> This lack of guidance

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<sup>241</sup>Ewan McKendrick, (ed), *Goode on Commercial Law*, (4<sup>th</sup> Edition, Penguin, London, 2010) at p488.

<sup>242</sup> The concept of payment is discussed in detail later in this thesis.

<sup>243</sup>Charles Proctor, (ed), *Mann on the Legal Aspect of Money* (7<sup>th</sup> Edition, Oxford University Press, London) 2007 at p9.

<sup>244</sup>Charles Proctor, (ed), *Mann on the Legal Aspect of Money* (7<sup>th</sup> Edition, Oxford University Press, London) 2007 at p11.

<sup>245</sup> Cases including *Tenax Steamship Co v Brimnes* [1973] 1 WLR 386 affirmed [1974] 1 QB 929; *Awilco A/S v Filvia Sp A de Navigazione* [1981] 1 WLR 314.

<sup>246</sup>Charles Proctor, (ed), *Mann on the Legal Aspect of Money* (7<sup>th</sup> Edition, Oxford University Press, London) 2007 at p9.

proves problematic in this thesis where consideration of the definition and application of crypto-currencies requires an understanding of the term “money” and the regulatory framework underpinning it.

Owing to the importance of the term “money” in the analysis of crypto-currencies it is important to analyse the limited available case law and legal opinions before undertaking an analysis of payment in *Chapter 3*. Mann the leading scholar in this area<sup>247</sup> agrees that *“it therefore seems appropriate for the lawyer to seek a definition of money, given the frequent use which is made both of the term itself and its many derivatives, including debt, damages, payment, price, capital, interest, tax, pecuniary legacy, and doubtless many others.”*<sup>248</sup>

Such analysis ought to commence with the well-used quote by Mann *“the quality of money is to be attributed to all chattels that are: issued under the authority of the law in force within a State of issue; under the terms of that State’s law, denominated by reference to a unit of force within a State of issue; under the terms of that State’s law, denominated by reference to a unit of account; and under the terms of that law, to serve as a universal means of exchange in the State of issue.”*<sup>249</sup>

The definition embodies four sections, not dissimilar to the economists’ analysis above:

- (i) Money is a chattel.<sup>250</sup>
- (ii) Money is issued by the state.
- (iii) Money is a unit of account.
- (iv) Money is used as a means of exchange.

Interpretation of these elements has varied since Mann proposed this definition owing to technological advancements such as the increasing use of bank transfers and electronic payments and the reduction in circulation of coins and notes. In the UK, notes and coins<sup>251</sup> now represent less than 5% of the whole money supply<sup>252</sup> with the remaining 95% of money supply consisting of bank account ledgers records of which are held on computer hard drives

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<sup>247</sup> J Fitchen, *Publication Review: Mann on the Legal Aspect of Money*, 2014 Edin L.R. 303 at 303 states that Mann has been judicially quoted on 11 occasions.

<sup>248</sup> Charles Proctor (ed), *Mann on the Legal Aspect of Money* (7<sup>th</sup> Edition, Oxford University Press, London), 2007 at p6.

<sup>249</sup> Charles Proctor (ed), *Mann on the Legal Aspect of Money* (7<sup>th</sup> Edition, Oxford University Press, London), 2007.

<sup>250</sup> In Scotland a “chattel” is corporeal moveable property.

<sup>251</sup> Known as M0.

<sup>252</sup> Known as M4.



as well as commercial instruments and contracts.<sup>253</sup> This movement from the traditional sphere of banking cannot be overlooked in considering the definition and application of money. Perhaps the reduction in notes and coins in the whole money supply is reflective of the requirement for modernisation of the legal thought in relation to how money should be conceptualised.

#### 2.4.1: Money is a chattel

*"The quality of money is to be attributed to all chattels...."*<sup>254</sup>

As detailed above, over the centuries a diversity of items have served the function of money as a tangible corporeal moveable capable of exchange, ranging from cattle, salt, tobacco, gold and silver to everyday use of coins and bank notes. Coins and bank notes are both considered as chattels in possession or personal property i.e. physical personal property in possession where possession itself is the badge of ownership and which can be used as a means of payment or exchange. The use of chattels as a means of exchange emphasises that elements cannot be considered in isolation as there is inevitably cross over.

Bank notes are regularly used as payment or means of exchange. Bank notes are additionally, in English law, a *chose in action* meaning they are personal rights over property which can be claimed or enforced only by action, and not simply by taking possession. Thus, on bank notes the wording "*I promise to pay the bearer on demand the sum of XX pounds,*" constitutes a promise to pay upon presentation to the Bank of England. This wording dates from when Bank of England notes represented deposits of gold, at which time a member of the public could exchange a Bank of England banknote for gold to the same value.<sup>255</sup> Bank notes are also deemed a negotiable instrument,<sup>256</sup> however in practice the bank note is used as a chattel and

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<sup>253</sup> R Folsom & M Cashman, *Digital Currency: A Primer*, Society for Computers and Law, 22 January 2014 <[www.scl.org/site.aspx?i=ed35452](http://www.scl.org/site.aspx?i=ed35452)> accessed 11 July 2015.

<sup>254</sup> Charles Proctor (ed), *Mann on the Legal Aspect of Money*, (7<sup>th</sup> Edition, Oxford University Press, London) 2007.

<sup>255</sup> Further information on <<http://www.bankofengland.co.uk/banknotes/Pages/about/faqs.aspx>> accessed 11 July 2015.

<sup>256</sup> Bills of Exchange Act 1882 s83 (promissory note)

- (1) A promissory note is an unconditional promise in writing made by one person to another signed by the maker, engaging to pay, on demand or at a fixed or determinable future time, a sum certain in money, to, or to the order of, a specified person or to bearer.
- (2) An instrument in the form of a note payable to maker's order is not a note within the meaning of this section unless and until it is indorsed by the maker
- (3) A note is not invalid by reason only that it contains also a pledge of collateral security with authority to sell or dispose thereof
- (4) A note which is, or on the face of it purports to be, both made and payable within the British Islands is an island note. Any other note is a foreign note.

owing to the fungible nature is exchanged for other coins and notes constituting legal tender<sup>257</sup> and its status as a negotiable instrument is of little practical significance.

Proctor<sup>258</sup> suggests that the existence of a physical chattel issued by or under the authority of the State is no longer a required feature in the definition of money<sup>259</sup> as creditors frequently accept cheques, bank transfers, credit cards, and any other forms of reasonable commercial settlement of debts which are not issued under the authority of the State. As considered, notes and coins now represent less than 5% of the whole money supply in the UK.<sup>260</sup> The use of these chattels through private entities has developed in response to technological and societal developments. It is acknowledged that there has been a divergence from the traditional chattel and it may no longer be an obvious chattel in the purest sense of the word i.e. a physical chattel which is held and ownership transferred but rather it can be an obligation. Thus, a chattel now includes incorporeal moveable property, rather than being restricted to corporeal moveable property. This obligation would include forms of credit and debit, amounting to personal obligations rather than a proprietary claim to the tangible moveable and therefore extend the definition of money to bank transfers and other forms of commercial settlement of debts. This acceptance is reflective of the development of a money society where use of physical chattels or corporeal moveables is no longer a requisite to the definition of money.

#### **2.4.2: Money is issued by the State**

The second aspect of Mann's definition is that money must be issued, authorised and monitored by the State in order to qualify as money. This aspect of Mann's definition aligns with the State Theory proposed by Knapp,<sup>261</sup> who opined that only chattels or money issued by the State under its legal authority can be deemed money; and that the value to be attributed is determined by law as opposed to the value of the work in the process of production. Given the complex nature of the State Theory this thesis does not propose to analyse the State Theory. However it is acknowledged that Knapp's analysis divided opinion and received both considerable criticism and strong support.<sup>262</sup> The key conclusion from the State Theory that

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<sup>257</sup> Currency and Bank Notes Act 1954 s1(4).

<sup>258</sup> Charles Proctor (ed), *Mann on the Legal Aspect of Money* (7<sup>th</sup> Edition, Oxford University Press, London) 2007 p40 at 1.68.

<sup>259</sup> Charles Proctor (ed), *Mann on the Legal Aspect of Money*, (7<sup>th</sup> Edition, Oxford University Press, London) 2007 p31.

<sup>260</sup> R Folsom & M Cashman, *Digital Currency: A Primer* Society for Computers and Law, 22 January 2014 <[www.scl.org/site.aspx?i=ed35452](http://www.scl.org/site.aspx?i=ed35452)> accessed 11 July 2015.

<sup>261</sup> Knapp, *Staatliche Theorie des Geldes* (4<sup>th</sup> Edition, 1923), translated by Lucas and Bonar, *State Theory of Money* (1924; abridged edition A.M. Kelley, 1973).

<sup>262</sup> There are number of works discussing Knapp's State Theory in considerable detail, including in Charles Proctor (ed), *Mann on the Legal Aspect of Money* (7<sup>th</sup> Edition, Oxford University Press, London) 2007.

the issuance and governance of money circulation by the State will be relied upon in this section.

At present in the UK, the State retains and exercises sovereignty over money matters.<sup>263</sup> The Bank of England has a monopoly of note-issuing power<sup>264</sup> and the issue of coinage<sup>265</sup> is the exclusive prerogative of the Crown, exercised through the Mint.<sup>266</sup> Banknotes issued by the authorised banks in Scotland<sup>267</sup> and Northern Ireland<sup>268</sup> are also legal currency and can be accepted throughout the United Kingdom, having been authorised and approved by Parliament.<sup>269</sup>

For clarity, gift vouchers issued by retailers are not money – as is often confirmed on such vouchers which state that the vouchers have no monetary value. This is in part because they are not issued by the State and cannot constitute money and also commercially a retailer does not want to offer a refund on a purchased gift voucher. Furthermore, gift vouchers often require to be redeemed failing which they expire. This demonstrates that they have a very limited role as a store of value and recent examples of retailers suffering insolvency questions the store of value properties.<sup>270</sup> The absence of store of value in the use and circulation of crypto-currencies is clearly important, although advocates of such instruments cite this as an advantage of being disjointed from state control. Crypto-currencies are a decentralised peer to peer system with no official oversight or regulation by a central bank or other regulator. Additionally there is no governing body monitoring the circulation and use of crypto-currencies, and as noted above, this affects the universal acceptance of crypto-currencies as a means of exchange and results in volatility in value. As crypto-currencies do not confine themselves to

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<sup>263</sup> The conclusions in this work could have been quite different if the Scottish Independence Referendum on 18 September 2014 had produced a “Yes” vote. First Minister at the time Alex Salmond proposed use of the pound sterling without having a central bank, nor the money being state backed. If this position had gone ahead the stability of the economy could have been called into question along with the topic of this chapter – the definition and use of money. Use of the pound sterling in Scotland would have amounted to use of money not issued by the State and other aspects would have had to be considered to determine if use of the pound sterling still constituted use of money in accordance with the definition proposed herein.

<sup>264</sup> The Bank of England, founded in 1694, is the central bank of the United Kingdom.

<sup>265</sup> Currency Act 1983 c9.

<sup>266</sup> <<http://www.royalmint.com/>> accessed 11 July 2015.

<sup>267</sup> Bank of Scotland, Clydesdale Bank and Royal Bank of Scotland as noted in <[http://www.acbi.org.uk/media/sni\\_notes\\_factsheet\\_nov12\\_copy1.pdf](http://www.acbi.org.uk/media/sni_notes_factsheet_nov12_copy1.pdf)> accessed 11 July 2015.

<sup>268</sup> Bank of Ireland, Danske Bank (formerly known as Northern Bank), First Trust Bank, and Ulster Bank as noted in <[http://www.acbi.org.uk/media/sni\\_notes\\_factsheet\\_nov12\\_copy1.pdf](http://www.acbi.org.uk/media/sni_notes_factsheet_nov12_copy1.pdf)> accessed 11 July 2015.

<sup>269</sup> Banking Act 2009 Part 6.

<sup>270</sup> For example, following the announcement that HMV was in administration the administrators announced that HMV would not accept gift vouchers but latterly confirmed that it would start accepting again. This questions the store of value properties of gift vouchers, see BBC Author, *HMV will accept gift vouchers*, (BBC, London, 21 January 2013) <<http://www.bbc.co.uk/news/business-21118711>> accessed 11 July 2015.

a single nation state or currency block such as the euro, it would be complex if not impossible to assign responsibility for such an instrument to any particular state.

Concerns regarding the future increased use and circulation of crypto-currencies have been raised given the current lack of appropriate regulation.<sup>271</sup> However, as noted, the use of crypto-currencies is still restricted to those who believe and trust in the system and the number of crypto-currency transactions is minor in comparison with fiat currencies. As will be examined in *Chapter 5 (Regulation)*, both national and European governments are considering whether central issuance and regulation of exchanges and crypto-currencies is the preferred route of protection for investors or rather if they should continue to evolve naturally.

### 2.4.3: Unit of Account

Money or notes must have a nominal value i.e. it must show on the face of it the value for which is effective in law to discharge an obligation. This unit of account enables a standard of value against which the value of commodities can be measured. However, the physical coins that an individual holds are a fungible token of the actual amount. One pound can be representative of another pound with both being interchangeable with one another. Additionally, under the applicable laws of the country a pound is a pound and that is the value ascribed thereto, however, if the coin was not legislatively deemed a pound the value of the metal would not be so high and would not be changeable for such an amount. In *R v Thompson*<sup>272</sup> it was held that *“money was only considered to have a value because it was just like any other goods. But nowadays such a conception has been universally abandoned: goods which have become a currency are no longer like any other goods.”*<sup>273</sup>

The foregoing analysis provides a detailed explanation as to *why* crypto-currencies do not constitute a unit of account. On the basis of the conclusions reached, it is clear that crypto-currencies should not be considered a unit of account equivalent to the properties of unit of account in relation to fiat currencies.

### 2.4.4: Medium of Exchange

Economists consider this to be the key element of money. The best known judicial definition was provided in *Moss v Hancock*.<sup>274</sup> Quoting Walker, Darling J stated money is: *“that which passes freely from hand to hand throughout the community in final discharge of debts and full payment for commodities, being accepted equally without reference to the character or credit*

<sup>271</sup> Craig Elwell, *Bitcoin: Questions, Answers, and Analysis of Legal Issues* (BBC, London, 28 January 2015) <<http://www.bbc.co.uk/news/uk-scotland-33394944>> accessed 11 July 2015.

<sup>272</sup> [1980] Q.B. 229.

<sup>273</sup> *R v Thompson* [1980] Q.B. 229 per Advocate General Mayras at 237.

<sup>274</sup> [1899] 2 QB 111 at 116.

*of the person who offers it and without the intention of the person who receives it to consume it or apply it to any other use than in turn to tender it to others in discharge of debts or payment for commodities.*" This interpretation confirms money as a medium of commerce or exchange which is universally accepted without question as to its viability nor usability. Darling J judicially aligned the legal interpretation of money as a medium of exchange with the economists' perspective of money making clear that money cannot be an object of exchange but rather a medium of exchange.

The present use of crypto-currencies does not square with the tests established in *Moss*. Crypto-currencies are not universally accepted as a means of exchange for goods and services owing to the lack of universal trust by the public at large. Demand and acceptance is restricted to the network who trust in the technology and viability of crypto-currencies. As noted in the analysis above, the transaction rate remains low when compared to established methods of payment. The restricted number of transactions does not demonstrate universal acceptance and consequently, crypto-currencies cannot be considered as an item which, to quote Darling J, "*passes freely from hand to hand throughout the community.*" Therefore the use of crypto-currencies may be likened to a commodity exchange rather than as a means of exchange.

#### **2.4.5: Store of Value**

This concept is discussed in detail in *R v Thompson*<sup>275</sup> specifically "*.....Gold and especially "monetary gold" is used as an insurance against devaluation. Consequently, even though transactions in gold or silver coins which are legal tender take the form of "commercial" transactions, they may be regarded as a form of investment, or if you prefer, of putting assets away.*"<sup>276</sup>

Money cannot lose its character, unless legislation formally demonetises the previous currency. In modern times although the value of money will fluctuate on the given exchange rate with other currencies, it maintains a relatively constant store of value. One reason for this is because it is backed / supported by a central bank. In economic terms, money does not lose its value<sup>277</sup> because it has not been spent; an individual in possession of money is not legally obliged to spend the money and retaining it will secure the value.

For the reasons explored above, crypto-currencies cannot be considered a reliable store of value and therefore fail to fulfil this legal requirement of money. Additionally,<sup>278</sup> it is possible

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<sup>275</sup> *R v Thompson* [1980] Q.B. 229.

<sup>276</sup> *R v Thompson* [1980] Q.B. 229 at p237 – 238.

<sup>277</sup> Ignoring the effects of inflation.

<sup>278</sup> As noted in *Chapter 1 (Crypto-currencies)* at 1.3.4 (*Outlaw*).

that legislation may outlaw the use of crypto-currencies as a means of exchange or prevent those holding crypto-currencies on behalf of others from dealing in it at their instruction through the failure to secure a licence to trade if that were to be introduced. Therefore the ability of crypto-currencies to be considered as a reliable store of value is, at best, uncertain.

## **2.5: Conclusions**

It is abundantly clear from the above analysis that crypto-currencies cannot be considered equivalent to “money.” The key requirement absent in crypto-currencies is the lack of sufficient acceptance of crypto-currencies to constitute a universal means of exchange. As noted, acceptance is restricted to the network of individuals and businesses that trust and believe in the properties of crypto-currencies. Use is therefore restricted to retailers who are prepared to accept crypto-currencies in receipt of goods and services and as yet, crypto-currencies are not widely accepted by retailers. It is acknowledged that use continues to increase. However, owing to the relative novelty of crypto-currencies there is no evidence of sustained use, circulation or acceptance by the public. Additionally, as noted, the volatility in value of crypto-currencies means they cannot be considered a reliable store of value. Again, the inability of crypto-currencies to meet this requirement means they cannot be construed as money.

These conclusions therefore confirm that the use of currency in their name is misleading and crypto-currencies are not, and should not, be considered money for the purposes of use nor investment.

If crypto-currencies cannot be considered money, a closer assessment of the uses of crypto-currencies must be undertaken. The following chapter will look at the mechanics of payment and consider if the use of crypto-currencies in exchange for goods and services is equivalent to payment or whether, if such exchanges amount to merely commodity exchanges or some similar concept.

## Chapter 3: Payment

### 3.1: Requirements

While exchanges may offer to hold crypto-currencies for customers without offering payment services – the vault or safekeeping function - crypto-currencies are increasingly used as a form of payment in exchange for goods and services.<sup>279</sup> A working definition of payment is therefore required to determine whether the use of crypto-currencies in exchange for the goods and services does constitute payment in a legal sense or whether the contract in which it is accepted should be characterised differently such as barter or mutual exchange rather than one of sale and purchase. Owing to the importance of the definition of payment, particularly electronic payment, in ascertaining whether contractual obligations have been discharged a body of case law has developed analysing payment mechanics, obligations, timing and assumptions. This chapter will examine payment case law relevant to crypto-currencies to enable consideration if payment by crypto-currencies actually constitutes payment in the traditional sense, or if such uses of crypto-currencies are equivalent to commodity exchange for services. In *Skatteverket v David Hedqvist*<sup>280</sup> Kokott AG has offered the view that bitcoin is for the purposes of VAT neither goods nor services but a payment mechanism and therefore not liable to VAT. However the CJEU is bound by the finding of the referring Swedish court that bitcoin is a pure form of payment.<sup>281</sup> For the reasons explored below in this chapter that finding from the referring court must be seriously questioned.

Scots<sup>282</sup> and English law<sup>283</sup> both require there to be *consensus in idem*<sup>284</sup> for legally enforceable contractual obligations to arise. Both legal systems adopt a model of offer and acceptance as an analytical tool to determine whether contractual relations have been formed. In relation to essential content both systems have similar requirements but English law traditionally requires a further essential element which is absent in Scotland - consideration. Such consideration can be token and does not require to be monetary. It is highly unlikely that any commercial organisation would be willing to engage in a contract for the provision of goods

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<sup>279</sup> Blockchain estimate there were approximately 406,621 transactions per day in the most popular crypto-currency, bitcoin, in early December 2014. Based on a 7 day rolling average. Available at <<https://blockchain.info/charts/estimated-transaction-volume>> accessed 11 July 2015.

<sup>280</sup> Case C-264/14 opinion of Kokott AG issued on 16 July 2015 <<http://curia.europa.eu/juris/document/document.jsf?jsessionid=9ea7d2dc30d555012c6119454c778d85909bf51a8d1d.e34KaxiLc3qMb40Rch0SaxuQbNj0?text=&docid=165919&pageIndex=0&doclang=FR&mode=lst&dir=&occ=first&part=1&cid=604912>> accessed on 3 August 2015.

<sup>281</sup> At para 17 of her opinion.

<sup>282</sup> Prof. H MacQueen et al (eds), Gloag and Henderson's The Law of Scotland (13<sup>th</sup> Edition, W.Green 2012) at 5.09 p129.

<sup>283</sup> For a summary of English law generally see H Beale (ed), Chitty on Contracts: General Principles, (31<sup>st</sup> Edition, Sweet & Maxwell 2012).

<sup>284</sup> This is a meeting of minds in aspects of the contract.

or services without payment or other consideration and therefore payment is also of significance in Scots law. What constitutes payment will now be considered.

### 3.2: What is payment?

The starting point in any contract will be to interpret the provisions of the contract itself. This is equally true in relation to what constitutes payment. The accepted principle is that ordinary words should be given their ordinary meaning. In the case of ambiguity, the English courts conclude that words should be interpreted in their commercial setting<sup>285</sup> with the application of business common sense.<sup>286</sup> Consideration of business common sense in contract interpretation is still appropriate despite the recent emphasis by the Supreme Court on application of the natural meaning of wording.<sup>287</sup> This can be contrasted with the application of general rules of contract interpretation by the Scots courts where contractual interpretation is restricted to the necessary interpretation of the ordinary meaning of the words.<sup>288</sup> Accordingly in the first instance payment will be interpreted as provided for in the contract itself. Where the contract is silent or ambiguous in relation to payment then resort must be had to a definitional approach.

Goode,<sup>289</sup> a leading academic, proposed the following working definition of payment  
*“....payment in the legal sense means a gift or loan of money or any act offered and accepted in performance of a money obligation. Money must therefore feature in some way, either*

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<sup>285</sup> Lord Mustill held in *Charter Reinsurance v Fagan* [1997] AC. 313 that the ordinary meaning of words should be applied (at *Charter Reinsurance Co Ltd v Fagan* [1997] AC. 313, at 384). This decision followed the rule of ordinary interpretation and application of words to determine the obligations of the respective parties. Lord Hoffmann developed Lord Mustill’s judgment in *Charter Reinsurance* concluding in *Investors Compensation Service (“ICS”) v West Bromwich Building Society* [1997] UKHL 28 that a contract should be read in its commercial setting to give sense to terms, particularly where the ordinary meaning attributed to the words is unclear or numerous. Although Lord Hoffmann’s decision in *ICS* has been widely followed and cited the Scottish courts have now adopted a slightly differing approach. The leading English interpretation of the decision in *ICS* is now the Supreme Court decision in *Rainy Sky SA and others v Kookmin Bank* [2011] UKSC 50, [2012] 1 All ER (Comm). Where the terms of a contract admit of ambiguity then that which is most consistent with business common sense will be preferred.

<sup>286</sup> *Ace Paper Limited v Fry and others* [2015] EWHC 1647 (Ch) 18 June 2015.

<sup>287</sup> *Arnold v Britton and others* [2015] UKSC 36.

<sup>288</sup> In *Forbo-Nairn v Murrayfield* [2009] CSIH 94 Lord Carloway ([2009] CHIH 94 at paragraph 12) expressed the opinion that ordinary methods of interpretation should be applied once an ambiguity has been identified. Thus methods such as *contra proferentem* and *ejusdem generis* should be invoked to ascertain the meaning of the contract. This was confirmed by Lord Hope in *Multi-Link Leisure Ltd v North Lanarkshire Council* [2010] UKSC 47. He concluded that re-wording the terms should not occur “until it has become clear that the language the parties actually used creates ambiguity which cannot be solved otherwise.” At para 57 Scottish judicial views prefer standard rules of interpretation in ascertaining the meaning and application of a contract. These rules can be applied to assessment of what constitutes payment in a commercial contract and will be applied to consider the ordinary meaning of the term payment to consumers and in the commercial setting.

<sup>289</sup> Proctor (ed), *Goode on Payment Obligations in Commercial and Financial Transactions*, (2<sup>nd</sup> Edition) (London, Sweet and Maxwell, 2009)



*because payment is in physical money or because the obligation to be discharged by the act of payment is a money obligation.....*<sup>290</sup>

Goode's definition is more expansive than Scots law requirements for contracts but, as noted, the inclusion of monetary payment is inevitable. Goode's definition is adopted for the purpose of this thesis. It can be broken down into several sections:

- (a) A gift or loan of money or any act
- (b) Offered and accepted
- (c) In performance of a money obligation

Taking each in turn, a gift or loan of money or any act of payment must be made by the debtor. A gift can be easily defined as the donation of a corporeal or incorporeal to another party for no return. The following paragraph will consider payment made by the debtor.

As already discussed,<sup>291</sup> payment into a bank account extinguishes one obligation and creates a new obligation, or *choses in action*, against the bank for repayment of an equivalent sum. Ownership is not retained and it is not equivalent to the transfer of funds into the bank, regardless of the terminology regularly used in society. This rule is applicable irrespective of the type of transfer occurring e.g. electronic transfer<sup>292</sup> or physical transfer of the cash or coins to the bank. The process of electronic transfer was discussed in the *Libyan Bank* case<sup>293</sup> where the transfer of funds from one account of the Libyan Bank at Bankers Trust to the Libyan Bank was undertaken.<sup>294</sup> It is clear that monies which are paid into an account are not transferred nor is there an assignation of existing rights. Rather the right is extinguished and a new right created. If individuals are using crypto-currencies for payment then the funds are not transferring but new rights are created. As already identified, crypto-currencies are fungible and the amounts paid in to online wallets do not necessarily need to be repaid with the identical crypto-currency unit. Thus, the concept of payment can constitute the extinguishing of one individual's rights, creation of a new right when the money is transferred through a third party which is then extinguished and a new right created when the funds are repaid. These rules

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<sup>290</sup> Proctor (ed), *Goode on Payment Obligations in Commercial and Financial Transactions*, (2<sup>nd</sup> Edition) (London, Sweet and Maxwell, 2009) at p498.

<sup>291</sup> In *Chapter 2 (Money)* at 2.1.1.1 (*Foley v Hill*).

<sup>292</sup> This term is used as a neutral term to avoid reference to money.

<sup>293</sup> *Libyan Arab Bank v Bankers Trust Co* [1989] QB 728.

<sup>294</sup> ".....an account transfer means the process by which some other person or institution comes to owe money to the Libyan Bank or their nominee, and the obligations of Bankers Trust is extinguished or reduced *pro tanto*, "Transfer" may be a somewhat misleading word, since the original obligation is not assigned (notwithstanding dicta in one American case which speak of assignment); a new obligation by a new debtor is created. Any account transfer must ultimately be achieved by means of two accounts held by different beneficiaries with the same institution. ....the obligation of Bankers Trust is extinguished and the obligation of A bank to the Libyan Bank is increased by the like amount..." *Libyan Arab Bank v Bankers Trust Co* [1989] QB 728 at p750.

have been applied in relation to theft and associated criminal offences in a number of English cases discussed below.<sup>295</sup>

Goode's second requirement is that the money must be offered by the debtor or by a third party having actual or apparent authority to make it on his behalf as a *pro tanto* discharge of the debtor's obligation to the creditor. An unauthorised payment by an independent third party is not accepted as a discharge of the debtor's obligation except where the debtor either ratifies expressly by nominating the third party as authorised to act on his behalf or by expressly accepting the benefit of the payment. Thus, the action must have the intended purpose of being applied against outstanding debts due to a creditor.

The above can be considered an offer of money or obligation in return for performance. Offer and acceptance of electronic funds transfer is not as easily ascertained as offer and acceptance of corporeal moveable property. Electronic fund transfer can be initiated by either the debtor's bank or creditor's bank – raising the question as to what constitutes the offer and conversely the acceptance. Such offer and acceptance was considered in the Scottish case of *HMV Fields Properties v Bracken Self Selection Fabrics*.<sup>296</sup> If an electronic fund transfer is initiated by the debtor's bank the funds are "pushed" to the creditors' bank by some form of credit transfer. Therefore it is clear that the funds are being offered by the debtor's bank, following instructions from the debtor, and accepted by the creditors' bank constituting acceptance of the funds. If, on the other hand, a funds transfer is initiated by the creditor's bank, the funds are effectively "pulled" from the debtor's bank accounts, for example by the presentment of a cheque for payment from that account or by the creditor initiating a direct debit on the basis of a previously granted authority by the debtor. Payment by cheque is an example of an offer by the debtor and acceptance by the creditor through payment into account. Although the transaction is initiated by the creditor's bank "pulling" the funds, such action is based upon the offer by the debtor through presentation of the cheque. As Geva<sup>297</sup> explained "...A payment mechanism can be broadly described as any machinery facilitating

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<sup>295</sup> At 3.3.1 (*R v Preddy*)

<sup>296</sup> 1991 SLT 31.

<sup>297</sup> "A payment mechanism is fundamentally a three-party arrangement. Hereunder, where A owes money to B, A's discharge is to be effected by X's payment to B, made with A's authority. This payment either creates a new debt owed by A to X, or discharges X's existing debt to A. In the latter case, one actual payment, made by X to B, discharges two debts: one owed by A to B and the other owed by X to A. This is one instance whereby the carrying of money in specie is avoided. Further deduction in the transportation of money is achieved where X is a depository of money owing A on account of money A entrusted with X. In such a case, payment by X to B need not necessarily be made in specie. It can rather be accomplished by a mere bookkeeping entry, namely by the creation of a new debt running from X in favour of B, in lieu of the old debt owed by X to A for that sum of money. In such a case, it is the face value of money, rather than money itself, that has been transmitted via the payment mechanism" as quoted in Benjamin Geva, *The Concept of Payment Mechanism*, Osgoode Hall Law Journal 24.1 (1986) at p4.

*the transmission of money in the payment of a debt, which enables the debtor to avoid the transportation of money and its physical delivery to the creditor in the discharge of the debt.*"<sup>298</sup>

Applying this to crypto-currencies, an individual must be involved in pushing the funds to the creditor's accounts through use of the private key. As yet, it is not possible to arrange for direct debits or payment by cheque with crypto-currencies. Therefore only "pushing" the funds is currently available as means of transferring crypto-currencies. Payment by means of "pulling" the funds requires conversion to fiat currencies to effect such transfers. Therefore, fiat currencies still enjoy a monopoly in transactions of this nature with the requirement for further technological advances in the Blockchain protocol required before transactions "pulling" funds are possible.

Storage in an online wallet is equivalent to the offer by the debtor and acceptance by the creditor. However, the mechanics of such offer and acceptance are different from the traditional sense of payment as third parties are involved in assisting the transfer to the relevant parties.

### **3.3: Monetary Obligation**

The final component of Goode's definition is in performance of a monetary obligation. Consideration of whether the dishonest appropriation of funds constitutes theft produces guidance as to the classification of crypto-currencies and use of performance of a monetary obligation. This section will explore the case law and consider application of the principles to the use of crypto-currencies.

#### **3.3.1: *R v Preddy***

In the English House of Lords case *R v Preddy*,<sup>299</sup>, Preddy had engaged in mortgage fraud. His mortgage application contained false statements which induced the building society to approve a mortgage. The Building Society instructed their bankers to transfer funds to Preddy's solicitors' client bank account. Preddy was unjustifiably enriched by these actions through the fraudulent scheme, to the detriment and reduction in the patrimony of the lender. The question for the court was whether this unjustified enrichment constituted a payment and theft of the Building Society's funds<sup>300</sup> or if another right had been breached. The Court held...*"when the bank account of the defendant...is credited, he does not obtain the lending institution's chose in action. On the contrary that chose in action is extinguished or reduced pro tanto, and a chose in action is brought into existence representing a debt in an equivalent*

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<sup>298</sup> Benjamin Geva, *The Concept of Payment Mechanism*, Osgoode Hall Law Journal 24.1 (1986) at p4.

<sup>299</sup> [1996] A.C. 815.

<sup>300</sup> In accordance with s15 of the Theft Act 1968.

*sum owed by a different bank to the defendant.*<sup>301</sup> Obtaining funds through the transfer did not involve property belonging to another person transferring but rather property being newly created or varied. Therefore Preddy's actions could not be considered to be theft within the meaning of section 15(1) of the Theft Act 1968.<sup>302</sup> This accords with the principles established in *Foley*<sup>303</sup> and *Skinner*.<sup>304</sup>

### 3.3.2: *Holmes v Governor of Brixton Prison*<sup>305</sup>

Following *Preddy*, the court in *Holmes* considered the new section 15A of the Theft Act which had been enacted following the *Preddy* decision, concluding that payment was not complete until any condition placed upon payment was removed. Holmes credited his personal account, deceitfully, while working at a large financial organisation. Such deception took place in the course of the payment transaction and therefore fell within the remit of the new section 15A of the Theft Act.

More recently *R v Waya*<sup>306</sup> considered<sup>307</sup> the offence of obtaining an electronic money transfer by deceit. These cases demonstrate the extension of the Theft Act and interpretation in relation to electronic transfers. Waya's conviction for obtaining "a money transfer by deception" can be equated with "wire fraud" in America.<sup>308</sup> In America, the principals of Silk Road

<sup>301</sup> [1996] A.C. 815 at 816 and further considered by Lord Jauncey from 841.

<sup>302</sup> This somewhat perverse decision resulted in reforms leading to section 15A being introduced to the Theft Act following recommendations by the Law Commission for England and Wales. The Law Commission produced a Report which stated "*as a result of the decision in Preddy, it is now difficult to prosecute an individual who obtains by deception any form of payment by any form of banking transfer.*" The Commission continued to state that "*as we understand Preddy, it did not involve any narrowing of the concept of property: it merely decided that the transfer of funds from one account to another cannot be described as obtaining, by the holder of the account credited, of the same property as that lost by the holder of the account debited. This appears to us to be a problem arising from the requirements of section 15(1), not from the concept of property.*" Accordingly a new section 15A was introduced by Theft (Amendment) Act 1996 c.62, s1(1) to combat fraudulently obtaining funds transfer which did not constitute theft in the ordinary sense. Sections 15 and 15A of the Theft Act 1968 have now been repealed by the Fraud Act 2006 which makes it easier to prosecute these cases as fraud in England aligning English criminal law with the broad concept of fraud in Scots law and thus brings to a closure the distinction which Lord Jauncey recognised in his opinion in *Preddy*.

<sup>303</sup> (1848) 11 House of Lords Cases (Clark's) 28. As further discussed in *Chapter 2 (Money)* at 2.1.1.1 (*Foley v Hill*).

<sup>304</sup> 1931 SLT 382. As further discussed in *Chapter 2 (Money)* at 2.1.1.2 (*Royal Bank of Scotland v Skinner*).

<sup>305</sup> [2004] EWHC 2020 (Admin); [2005] 1 WLR 1857 (DC).

<sup>306</sup> [2012] UKSC 51.

<sup>307</sup> Waya bought a flat with some of his own money and the balance provided by a mortgage lender. To obtain the mortgage Waya had made false statements about his employment record and earnings. The mortgage lender put Waya's solicitors in funds shortly before completion of the sale and his solicitor held those funds in a client account in trust for and to the order of the lender until they were paid direct to the vendor's solicitors on completion. In April 2005, Waya repaid the mortgage in full and remortgaged with a different lender, borrowing over and above what was required to redeem the original mortgage. Waya was convicted of obtaining a money transfer by deception contrary to section 15A of the Theft Act 1968, as inserted, in respect of the original mortgage. The case continued to consider confiscation of the property which is outwith the scope of this thesis.

<sup>308</sup> See section 1.4.3 (Case Study C: Liberty Reserve (crypto-currency & exchange))

have been found guilty of wire fraud and imprisoned for the money laundering and criminal activities associated with Silk Road.<sup>309</sup> This correlation between wire fraud and obtaining a money transfer by deception is obviously key given the nature of exchanges and the actions of participants in these schemes.

### 3.3.3: *Aectra Refining and Manufacturing Inc v Exmar NV*

*Aectra Refining and Manufacturing Inc v Exmar NV*<sup>310</sup> considered the use of CHAPS<sup>311</sup> and when payment on the system occurs. On the proper construction of the transfer form used in the CHAPS, a remitting bank was authorised to debit a customer's account when the form had correctly identified the beneficiary's receiving bank, sort code and account number: the standard CHAPS practice did not require correspondence between those identifiers and the beneficiary's name.<sup>312</sup> A customer who had named the beneficiary correctly but entered an incorrect sort code and account number on the CHAPS form could not recover the completed payment from the remitting bank. The receiving bank, in accordance with banking practice, did not check the name on the account and relied on the sort code and account number. Account names were not checked as it would impact on the ability to transfer funds within the guaranteed 1.5 hours.<sup>313</sup> As crypto-currencies are still relatively novel there is no common practice or rules governing the checks undertaken by exchanges holding funds in online wallets and thereafter transferring such funds. However, given the requirement of the public Blockchain it appears the likelihood of incorrectly completing the information required is slight and individuals are required to correctly complete the information before any transfer can occur. The actions of miners, checking the authenticity of the transactions is not dissimilar to the checks required for CHAPS transactions. This is an area where regulation could be introduced to assist in the interpretation of when payments made become effective.

### 3.4: Delivery?

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<sup>309</sup> Ross Ulbricht, the creator of Silk Road was convicted of all seven charges on 4 February 2015. Further information is available at BBC Author, *Ross Ulbricht: Silk Road creator convicted on drugs charges*, (BBC, London, 5 February 2015) <<http://www.bbc.co.uk/news/world-us-canada-31134938>> accessed 11 July 2015; Stan Higgins, *Ross Ulbricht Found Guilty of Operating Silk Road Dark Market*, (Coindesk, USA, 4 February 2015) <<http://www.coindesk.com/ross-ulbricht-found-guilty-operating-silk-road-dark-market/>> accessed 11 July 2015. Further discussion in *Chapter 1 (Crypto-Currencies)* at 1.4.3 (*Silk Road*) and 1.4.6 (*Silk Road 2*).

<sup>310</sup> [1994] 1 WLR 1634.

<sup>311</sup> The Clearing House Automated Payment System is the automated payment system used to make payments on the same day in the UK, in sterling provided instructions are received before 1pm.

<sup>312</sup> Definition of "unique identifier" is a combination of letters, numbers or symbols specified to the payment service user by the payment service provider and to be provided by the payment service user to identify unambiguously the other payment service user and/or his payment account for a payment transaction and use thereafter in paragraph 48. The case was determined prior to the introduction of the Payment Services Directive which requires certain meta data to be transmitted with payments.

<sup>313</sup> *Tidal Energy Ltd v Bank of Scotland Plc* [2014] EWCA Civ 1107.

Finally, whilst payment often involves the performance of a monetary obligation, it does not require the delivery of physical money. Thus, owing to the increased usage of online accounts, the electronic transfers are undertaken behind the scenes and the individual does not physically touch nor transfer corporeal moveable money. Additionally, money need not transfer hands where the items are setoff against existing debts or used to offset a rolling customer record.<sup>314</sup> These payments can all be conducted electronically.

Parties can effect a change in their relative wealth by agreeing to such change in their relative positions through third parties. Both have debt relationships with their respective third parties, and the payment mechanism is used to increase the debt a third party owes the payee and reduce the debt a third party owes the payer.<sup>315</sup> The values of these *choses in action* are altered to achieve the movement in buying power or wealth. The relationship in Scotland corresponds with the English examples albeit different terminology is applicable. The payee with a personal right or obligation has a right in action against the debtor or his representatives. The personal right is a real right in the law of obligations, and the payee may oblige the debtor to fulfil that obligation.<sup>316</sup> The payer, in making a non-cash payment, sets in train a course of events at the end of which its monetary rights are worth less, and the payee's monetary rights are worth more. Provided that the payee is willing to treat this as a valid payment, it is good consideration for the purchase or effective discharge of existing debt.<sup>317</sup>

Modern payment systems do not generally involve an assignment of underlying rights. Instead they result in the increase and decrease in institutional liabilities owed to the payer and payee. No property is transferred through this process. The payer and payee both hold intangible property, both before and after the transaction. Neither acquires nor disposes of these chattels during the transfer (as least not from or to each other). Lord Millett stated in *Foskett v McKeown*<sup>318</sup> that no money or property passes through the payment system. Instead, the system is “*simply a series of debits and credits that are causally and transactionally linked.*”<sup>319</sup> These debits and credits are recorded in ledgers not dissimilar to the Blockchain ledger of crypto-currency transactions, albeit the Blockchain is public. The differing aspect is the anonymity of the traditional payments in comparison with the publicly announced public Blockchain ledger.

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<sup>314</sup> These transactions are not restricted to electronic funds transfers.

<sup>315</sup> Rhys Bollen, *Continuing confusion over what a payment is*, CSLR 2005 1(1), p31 – 38.

<sup>316</sup> Prof. H MacQueen et al (eds), *Gloag and Henderson's The Law of Scotland* (13<sup>th</sup> Edition, W.Green 2012) at 1.05 on p4.

<sup>317</sup> Rhys Bollen, *Continuing confusion over what a payment is*, CSLR 2005 1(1), p31 – 32.

<sup>318</sup> [2001] 1 AC 102.

<sup>319</sup> [2001] 1 AC 102 at 128.

### 3.5: Application to the operation of crypto-currencies

As will be discussed, the delivery and acceptance of funds in crypto-currency transactions operate differently. A question arises regarding the risk to the merchant and consumer when paying by crypto-currencies. However, this risk is being addressed with the development of new Blockchain technology with multi signature and escrow systems<sup>320</sup> to ensure that delivery and acceptance are assured before the merchant receives the funds. One of the core benefits for merchants accepting payment by crypto-currency is the reduced transaction cost – currently merchants receiving credit card payments must pay up to 3% of the value of each transaction to traditional payment service providers to undertake the transaction. These fees have not gone unnoticed by exchanges and payment processors with Coinbase and Bitpay offering to process bitcoin payments for 0% fee and charge.<sup>321</sup> However as noted<sup>322</sup> at present miners will still receive block rewards for solving the algorithms which are simply created by the system and may themselves add transaction fees and the exchanges will remunerate themselves through the exchange rates which they offer to and from fiat currencies.

### 3.6: Right to payment?

In *Tresender-Griffin v Co-operative Insurance Society Limited*<sup>323</sup> Denning LJ stated that sterling is a constant unit of value in the eye of the law against which everything is measured.<sup>324</sup> This works within the context of a single legal system but completely ignores exchange rate risk where another currency is the unit of account of either party. This can be distinguished from crypto-currencies which are not universally accepted and are restricted to those users who trust and accept the worldwide use. Therefore this opinion is of importance when considering the potential for crypto-currencies to be used as a universal means of exchange or payment for goods and services. As Goode states, “*the parties are not entitled or obliged to demand and receive payment according to the real value of the money of account at due payment date compared with its value at contract date, they are merely concerned with the nominal value specified in the contract.*”<sup>325</sup> Nonetheless, Denning’s description is one of

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<sup>320</sup> Escrow is English terminology which at present, has no equivalent provisions in Scotland. This can be a bond, deed or other document held in the hands of a third party until a condition is lifted. A practical example would be holding funds in escrow until the signed contract is received.

<sup>321</sup> United Kingdom Digital Currency Association, *The UK Digital Currency Association’s response to HM Treasury’s Digital Currencies: Call for Information*, 3 December 2014.

<sup>322</sup> In *Chapter 1 (Crypto-currencies)* at 1.2 (*Operation*).

<sup>323</sup> [1956] 2 QB 127.

<sup>324</sup> “.....a man who stipulates for a pound must take a pound when payment is made, whatever the pound is worth at that time. Sterling is the constant unit of value by which in the eye of law every else is measured. Prices of commodities may go up or down, other currencies may go up or down, but sterling remains the same.” [1956] 2 QB 127 at 144.

<sup>325</sup> R.M. Goode, *Payment Obligations in Commercial and Financial Transactions*, (London, Sweet and Maxwell, 1983) at p33.

considerable importance in analysing crypto-currencies as payment mechanisms. If a contract stipulates payment be made in a specific crypto-currency then the payee must uphold this obligation. In a recent American example the parties chose bitcoin as consideration for performance and the court subsequently held payment was to be made in bitcoin.<sup>326</sup> As discussed, bitcoin is not a currency because it is not money nor currency, at best bitcoin can be seen as commodity money or a funds transmission vehicle. While courts have power to make awards in foreign currency in appropriate circumstances bitcoin does not attract this status for the simple reason that it is not a currency. Thus an order for payment is therefore for implement i.e. an order *ad factum praestandum* to deliver bitcoin to the value of XX to the pursuer.<sup>327</sup> Failure to deliver that obligation permits going back to court for payment in fiat currency. However, as has been detailed in the preceding chapter on *Money*, contracting on the basis of payment by crypto-currency can be either a risky, and potentially costly commitment or an exciting commercial opportunity given the fluctuating values and lack of regulation.

### 3.7: Payment Regulation

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<sup>326</sup> Stan Higgins, *Judge Rules in Peer-to-Peer Bitcoin Lending Lawsuit*, (Coindesk, USA, 18 June 2015) < <http://www.coindesk.com/judge-rules-in-peer-to-peer-bitcoin-lending-lawsuit/> > accessed 11 July 2015

<sup>327</sup> The relevant rules in Scotland are in the Court of Session Rules Chapter 7 (Decrees for payment in foreign currency) 7.5. (1) Where an application is made under rule 7.1 for an extract of a decree for payment in a foreign currency, the applicant shall lodge with the note to the Extractor a certified statement of the rate of exchange prevailing at- (a) the date of the decree sought to be extracted, (b) the date on which the note to the Extractor is lodged, or (c) a date within three days before the date on which the note to the Extractor is lodged, and the sterling equivalent of the principal sum, interest and expenses decerned for. (2) The certified statement required under paragraph (1) shall be by an official in the Bank of England or an institution authorised under the Banking Act 1987 (a). The equivalent rules in the Sheriff Court is contained in Act of Sederunt (Sheriff Court Ordinary Cause Rules) 1993 No.1956 (s223) SCHEDULE 1: 30.3.(1) Where decree has been granted for payment of a sum of money in a foreign currency or the sterling equivalent, a party requesting extract of the decree shall do so by minute endorsed on or annexed to the initial writ stating the rate of exchange prevailing on the date of the decree sought to be extracted or the date, or within 3 days before the date, on which the extract is ordered, and the sterling equivalent at that rate for the principal sum and interest decerned for; (2) A certificate in Form G18, from the Bank of England or a bank which is an institution authorised under the Banking Act 1987 certifying the rate of exchange and the sterling equivalent shall be lodged with the minute requesting extract of the decree; (3) The extract decree issued by the sheriff clerk shall mention any certificate referred to in paragraph (2).



The Internal Market and Services Directorate of the European Commission explain that the “crucial” Payment Services Directive<sup>328</sup> (“PSD”) was intended to provide a coherent legal framework for cross-border payments<sup>329</sup> in the European Economic Area (EEA).

The PSD brought within the sphere of regulation other payment service providers not already regulated as banks or clearing houses. The latter are organisations which offer back office services allowing banks to communicate with each other in relation to effecting the mechanics of payments.<sup>330</sup> Application is limited “to payment service providers whose main activity consists in the provision of payment services to payment service users.”<sup>331</sup> The extension to payment service providers requires further analysis to assess (i) what constitutes a *payment service provider*; (ii) whether exchange providers can be deemed *payment services providers* and are included under the PSD; (iii) or if not, whether extension of the PSD to exchange providers is plausible. Finally, this section will examine the protections guaranteed by the establishment of the new Payment Services Regulator and the proposal for updating the PSD by means of a second Payment Services Directive.<sup>332</sup>

The PSD was transposed into domestic law in the UK through the Payment Services Regulations 2009<sup>333</sup> (“PSR”). As noted, the PSD extended the right to undertake regulated payment services to the new entity, payment service provider which refers to the services of payment institutions. The PSD regulates a previously unregulated sector of “payment institutions” (e.g. money remitters, retailers, and phone companies) to enable the provision of payment services alongside banks. Broadly, the PSR applies where the services are provided from an establishment maintained by a payment service provider in the UK (a bank, Electronic Money Institution or Payment Institution) and the payment is made within the EEA and crucially, carried out in the euro or currency of the state in which the transaction is conducted i.e. in the UK sterling would be applicable. Clearly, transactions for payment of goods and services undertaken by exchanges and online wallets are not be undertaken in fiat currencies but in crypto-currencies. Therefore application of the PSD in its current guise to exchanges

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<sup>328</sup> 2007/64/EC on payment services in the internal market amending Directives 97/7/EC, 2002/65/EC, 2005/60/EC and 2006/48/EC and repealing Directive 97/5/EC.

<sup>329</sup> Charlie McCreevy, Internal Market and Services Commissioner, Press Release <[http://europa.eu/rapid/press-release\\_IP-07-1914\\_en.htm?locale=en](http://europa.eu/rapid/press-release_IP-07-1914_en.htm?locale=en)> accessed 11 July 2015.

<sup>330</sup> Cheque Clearing is dealt the Cheque and Clearing Company see <<http://www.chequeandcredit.co.uk/>> accessed on 11 July 2015; BACS payments and Faster Payments are handled by Bacs Payment Schemes Ltd see <<http://www.bacs.co.uk/Bacs/Corporate/Pages/default.aspx>> accessed 11 July 2015; CHAPS payments are handled by CHAPSCO <<http://www.chapsco.co.uk/>> accessed on 11 July 2015. Operation of a clearing house is a regulated activity under part XVIII of FSMA.

<sup>331</sup> Payment Services Directive 2007/64/EC at Recital 6. Available online at <<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32007L0064&from=EN>> accessed 11 July 2015.

<sup>332</sup> Those in the industry have expressed concerns that it is too early to recast the PSD regime (as it has only been 4 years since the PSD was implemented in the UK in November 2009).

<sup>333</sup> SI 2009/209.

and payment is at best questionable<sup>334</sup> and the regulation is currently being ignored by exchanges. The lack of regulation permits those “mining” and owning exchanges to have significant powers in crypto-currency transactions. The United Kingdom Digital Currency Association [UKDCA]<sup>335</sup> responded to the UK Government’s Call for Information<sup>336</sup> with the recommendation that regulation of the infrastructure for conversion of crypto-currencies to and from fiat currencies should be regulated under the PSR. This regulation would monitor conversions into or from fiat currencies i.e. regulate the fiat element undertaken by exchanges. Classification of exchanges as payment institutions would suggest the primary purpose of exchanges would be to facilitate payment between consumers and retailers. The UKDCA acknowledge this would create a hybrid approach to regulation with further guidance required for monitoring other actions of exchanges<sup>337</sup> and will be further considered in the forthcoming chapters.

The PSD introduces the right for the payment service provider to specify the information required to execute a payment order correctly. This includes coherent unique identifier information. The PSD permits the payment service provider to act in a diligent and coherent manner and request a unique identifier from the payee. Where the unique identifier is found to be incoherent, the payment service provider should be permitted to refuse payment. This “unique identifier” is metadata associated with the payment to prevent fraud.<sup>338</sup> There was discussion at EU level whether the unique identifiers should be introduced through the proposed second payment services directive or fourth anti-money laundering – clearly the former was the preferred method. This links the payment protection to consumers with the anti-money laundering measures discussed in the following sections.

Meantime, it is useful to note that the PSD states that “...*this Directive should lay down rules on the execution of payment transactions where the funds are electronic money, as defined in Article 1(3)(b) of Directive 2000/46/EC. This Directive should, however, neither regulate issuance of electronic money nor amend the prudential regulation of electronic money institutions as provided for in Directive 2000/46/EC. Therefore payment institutions should not*

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<sup>334</sup> The potential amendments and application to crypto-currencies will be considered further in *Chapter 4 (Consumer Protections)* and *Chapter 5 (Regulation)*.

<sup>335</sup> The UK Digital Currency Association, a non-profit organisation established by individuals and businesses who recognise the vision digital currencies ultimately represent. Further information available at <<https://www.ukdca.org/>> accessed 11 July 2015.

<sup>336</sup> Digital currencies: Call for Information, closed 3 December 2014 <<https://www.gov.uk/government/consultations/digital-currencies-call-for-information/digital-currencies-call-for-information>> accessed 11 July 2015.

<sup>337</sup> United Kingdom Digital Currency Association, *The UK Digital Currency Association’s Response to HM Treasury’s Digital Currencies: Call for Information*, 3 December 2014 at p2.

<sup>338</sup> Payment Services Directive 2007/64/EC at Recital 70 & 71. Available online at <<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32007L0064&from=EN>> accessed 11 July 2015.

*be allowed to issue electronic money.*<sup>339</sup> Analysis of the issuance of electronic money will be undertaken in the following chapters' analysis of the E-money Directive.

Finally, reference should be made to the newly established Payment Systems Regulator in the UK. Following the Treasury Report in July 2011<sup>340</sup> outlining serious concerns about the governance of payment systems, the Government published the "Opening up UK Payments" consultation in March 2013<sup>341</sup> with the aim of bringing payment systems under formal economic regulation. As a result, the Payment Systems Regulator ("the Regulator"), a subsidiary of the FCA<sup>342</sup> was incorporated and became operational in April 2015<sup>343</sup> operating as a competition focused regulator of payment systems.

The Regulator has three objectives: to promote competition, promote innovation; and ensure that payment systems are developed and operated in the interests of service-users.<sup>344</sup> The Regulator recently concluded a Consultation<sup>345</sup> specifying the regulatory framework and policies that the Regulator proposed to adopt. Following the consultation<sup>346</sup> the Regulator regulates the clearing houses, which were previously authorised under FSMA,<sup>347</sup> operating the main interbank payment systems, namely BACS, CHAPS, Faster Payments Services (FPS), LINK, Cheque and Credit Clearing (C&CC) and Northern Ireland Cheque Clearing (NICC) and the two largest card payment systems in the UK, MasterCard and Visa. The

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<sup>339</sup> Payment Services Directive 2007/64/EC at Recital 9. Available online at <<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32007L0064&from=EN>> accessed 11 July 2015.

<sup>340</sup> Treasury – Nineteenth Report, *Independent Commission on Banking*, 19 July 2011 <<http://www.publications.parliament.uk/pa/cm201012/cmselect/cmtreasy/1069/106902.htm>> accessed 11 July 2015.

<sup>341</sup> HM Treasury, *Opening up UK payments*

<[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/221903/consult\\_opening\\_up\\_uk\\_payments.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/221903/consult_opening_up_uk_payments.pdf)> accessed 24 May 2015; and HM Treasury, *Opening up UK payments: Response to Consultation*, October 2013.

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/249085/PU1563\\_Opening\\_up\\_uk\\_payments\\_Government\\_response.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/249085/PU1563_Opening_up_uk_payments_Government_response.pdf)> accessed 11 July 2015.

<sup>342</sup> The Payment Systems Regulator was incorporated in April 2014 and became fully operational in April 2015.

<sup>343</sup> The Payment Systems Regulator launched on 1 April 2015. This new economic regulatory intends to develop a system which works well for the individuals that use them. Further information is available on the Payment Systems Regulator website <<https://www.psr.org.uk/>> accessed 24 May 2015.

<sup>344</sup> FCA Paper, *A new regulatory framework for payment systems in the UK (PSO CP14/1)*, November 2014 <<http://www.fca.org.uk/static/documents/psr/psr-cp14-1-cp-a-new-regulatory-framework-for-payment-systems-in-the-uk.pdf>> accessed 11 July 2015.

<sup>345</sup> Consultation closed on 12 January 2015.

<sup>346</sup> HM Treasury, *Designation of payment systems for regulation by the Payment Services Regulator*, 14 October 2014. <<https://www.gov.uk/government/consultations/designation-of-payment-systems-for-regulation-by-the-payment-systems-regulator/designation-of-payment-systems-for-regulation-by-the-payment-systems-regulator>> accessed 11 July 2015.

<sup>347</sup> s288, FSMA 2001

Regulator's powers do not extend to exchanges nor to Western Union<sup>348</sup> and similar money remittance services as these have not been designated by the Treasury.<sup>349</sup> Should it be concluded that regulation is desired, a relatively straightforward option would be to extend the powers of the Regulator<sup>350</sup> to cover exchanges. The legislative base of the draft second Payment Services Directive is Article 114 TFEU – the approximation of law of member states to facilitate the establishment and functioning of the EU. Therefore mutual cooperation is required rather than maximum harmonisation which permits the UK to choose to over implement and extend protections to consumers by the regulation of exchanges.

### 3.8: Conclusions

It is evident from the above analysis that electronic transfer of funds to effect payment does not actually transfer the funds but extinguishes one personal right or *chose in action* and creates a personal right to repayment. Applying this principle to exchanges, upon payment into the online wallet the individual extinguishes the right of ownership of the crypto-currency or whatever is deposited. Instead, the individual receives a personal right to repayment. This right will ensure repayment at the current value of crypto-currency. The above analysis confirms that exchanges are, at present, outwith the regulatory framework. Thus, if as has already occurred on a number of occasions, an exchange is subject to hacking or other attack then the services are not protection under the payment regulation. This will be discussed further in the Chapters on regulation.

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<sup>348</sup> The Western Union Company is a financial services and communications company enabling person-to-person money transfer, money orders, business payments and commercial services worldwide via telegraph. Further information available at <<http://www.westernunion.co.uk/gb/Home.page>> accessed 11 July 2015.

<sup>349</sup> See <<https://www.psr.org.uk/payment-systems/who-we-regulate>> accessed on 15 July 2015.

<sup>350</sup> This will be examined in further detail in the forthcoming *Chapter 6 (Recommendations & Conclusions)*.

## Chapter 4: Consumer Protections

### 4.1: Overview

The preceding chapters sought to analyse crypto-currency contracts in terms of existing, well understood contractual frameworks for banking relationships, for deposit and in relation to payments. It is recognised that the relationship with exchanges may be a business to business (“B2B”) contract or a business to consumer contract (“B2C”). This chapter will explore the contractual protections applicable to banking, deposit and payment transactions offered to consumers within the EU in general,<sup>351</sup> their transposition into domestic UK law, alongside indigenous UK protections<sup>352</sup> and application to crypto-currency transactions.

### 4.2: Governing Law

An examination of aspects of private international law is required in order to establish which legal regime will apply to any contract which is executed entirely in an online environment. The contractual governing law, whether explicit or implied, dictates the applicable law for interpretation of the contract, the respective obligations of both parties to the contract and the resolution of any disputes under the contract. Determination of the governing law is therefore important when exploring the rights and remedies available to parties. However, in relation to a crypto-currency contract it is a difficult concept to pin down due to its decentralised peer to peer nature. If the crypto-currency owes its existence to the Blockchain and that does not occupy a single geographic place on any server it is almost impossible to determine which legal system governs the creation or transfer of crypto-currencies. This creates possible legal anomalies and difficulties between creation and use. When new crypto-currencies, for example bitcoins, are created by rewarding the miners verifying transactions and adding them to the Blockchain they too only exist virtually through their representation in the Blockchain. However exchanges will have a physical location as will the consumers who interact with them. It is proposed to examine those relationships rather than trying to associate crypto-currencies themselves with a particular legal system. It is thus at the points of conversion to fiat currencies or in relation to payment instructions that those interactions can be ascribed using generally applicable existing rules of private international law. Having considered the answers provided

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<sup>351</sup> Owing to the scope of private international law, this section aims to outline the key principles in relation to crypto-currencies and the relationship between consumers and exchanges. However, this is by no means an in depth analysis and a further review of the case law on habitual residence and place of performance specifically is recommended. This section therefore aims to highlight some of the concerns and provide a high level overview of the private international law perspective.

<sup>352</sup> Indigenous UK protections will be touched upon in this chapter but explored further in the forthcoming chapter on regulation.

by private international law in relation to the governing law, this chapter will consider the protections offered assuming that UK and/or EU law will apply

### 4.3: Private International Law

Should the parties reach a position where there are differences between them which they are unable to resolve, the courts may, in the absence of explicit agreement,<sup>353</sup> be required to determine the governing law of the contract – in the absence of any contractual alternative dispute resolution provisions or which may be imposed by operation of law. As Tang explains this is not straightforward as “*the internet is ‘a network of networks,’ which breaks down traditional borders between each country and creates a virtually borderless market.*”<sup>354</sup> This online borderless market, certainly in relation to crypto-currencies, is also largely anonymous. It is often unclear within the bitcoin ecosystem where parties are incorporated or have their real seat. The absence of mandatory anti-money laundering controls allows individuals to disguise their real identity even though the exchanges and consumers will have physical locations. The anonymity includes the absence of information relating to domicile or habitual residence – matters of key importance to private international law<sup>355</sup> and to any court required to address resolution of any contractual disputes. These difficulties will be examined in the analysis of exchange terms and conditions in this chapter.

### 4.4: Choice of law

The primary rule determined under the Rome 1 Regulation<sup>356</sup> is party autonomy in respect of choice of law. The parties are free to choose the governing law in terms of the contract.<sup>357</sup> The Uniform Commercial Code (“UCC”)<sup>358</sup> which has been adopted by all fifty US states provides a similar rule.<sup>359</sup> Where there has been no effective choice made by the parties at the time of entering into contractual relations then, within the EU, a crypto-currency Business to Business [B2B] contract will have the implied choice of law of the habitual residence of the service

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<sup>353</sup> The terms and conditions contained in *Appendix 2 (Terms and Conditions)* at *Appendix 2C (ANXBTC)* do not have an express governing law clause.

<sup>354</sup> Sophia Tang Zheng, *Electronic Consumer Contracts in the Conflict of Laws*, (Hart Publishing, Oxford, 2009), at p12 – 13.

<sup>355</sup> Sophia Tang Zheng, *Electronic Consumer Contracts in the Conflict of Laws*, (Hart Publishing, Oxford, 2009), at p13.

<sup>356</sup> Regulation (EC) No 593/2008 of the European Parliament and of the Council of 17 June 2008 on the law applicable to contractual obligations (Rome 1).

<sup>357</sup> Art 3(1).

<sup>358</sup> Uniform Commercial Code § 1-301. The UCC applies to Bank Deposits (article 4), Funds Transfers (Article 4A) and Investment Securities (Article 8). For the purposes of this chapter it is assumed that Article 4A has the potential to apply to crypto-currency payment transactions.

<sup>359</sup> Reference to the UCC is to provide a comparator for the EU and the focus on this section will remain in the EU.

provider.<sup>360</sup> However where the contract is a Business to Consumer [B2C] one, that is a contract where one party is a natural person not acting within the scope of his trade or profession and the other party is acting in such a professional capacity then the applicable law will be that of the consumer's habitual residence,<sup>361</sup> if the professional party either pursues his activities in the country where the consumer has his habitual residence or directs his activities to that country.<sup>362</sup> It is not clear what "directing activities" means. Having a website in English hosted outwith the EU and available within the EU may not be directing activities but clearly, if that were supported by other marketing materials which were directed to a particular member state through press or radio advertising that would presumably establish directing activities.<sup>363</sup> The Court of Justice of the European Union [CJEU] has considered the interpretation of "directing activities" concluding that the contract need not be concluded at distance to constitute directed activities.<sup>364</sup> It appears that the question of directing activities is therefore one which falls to be determined by the facts in individual cases and that as yet, the jurisprudence available from the Court of Justice of the European Union is not sufficiently developed to provide an entirely predictable result in any given situation. A consumer would however be prohibited from relying on Rome 1 should he complete an order form misleading the trader to believe him to be habitually resident in a country in which the goods were legally directed to be sold.<sup>365</sup> If the party autonomy rules are followed, Article 6 of Rome 1 Regulation provides that the rights of the consumer shall not be less than those which would have been

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<sup>360</sup> Art 4(1)(b).

<sup>361</sup> Under Rome 1 Regulation.

<sup>362</sup> Art 6(1).

<sup>363</sup> Further analysis of directing activities is noted in *Peter Pammer v Reederei Karl Schlüter GmbH & Co. KG* (C-585/08) and *Hotel Alpenhof GesmbH v Oliver Heller* (C-144/09). , where the Court stated Recital 24 in the preamble to Regulation No 593/2008 is worded as follows: 'With more specific reference to consumer contracts, ... consistency with Regulation (EC) No 44/2001 requires both that there be a reference to the concept of directed activity as a condition for applying the consumer protection rule and that the concept be interpreted harmoniously in Regulation (EC) No 44/2001 and this Regulation, bearing in mind that a joint declaration by the Council and the Commission on Article 15 of Regulation (EC) No 44/2001 states that "for Article 15(1)(c) to be applicable it is not sufficient for an undertaking to target its activities at the Member State of the consumer's residence, or at a number of Member States including that Member State; a contract must also be concluded within the framework of its activities". The declaration also states that "the mere fact that an Internet site is accessible is not sufficient for Article 15 to be applicable, although a factor will be that this Internet site solicits the conclusion of distance contracts and that a contract has actually been concluded at a distance, by whatever means. In this respect, the language or currency which a website uses does not constitute a relevant factor."

<<http://curia.europa.eu/juris/document/document.jsf?jsessionid=9ea7d2dc30dd7a646deac3cf4a888e15828e8a4c506a.e34KaxiLc3qMb40Rch0SaxuPbxf0?text=&docid=83437&pageIndex=0&doclang=en&mode=lst&dir=&occ=first&part=1&cid=44467>> accessed 11 July 2015.

<sup>364</sup> *Daniela Mühlleitner v Ahmad Yusufi and Wadat Yusufi* Case

C-190/11<<http://curia.europa.eu/juris/document/document.jsf?text=&docid=126428&pageIndex=0&doclang=EN&mode=lst&dir=&occ=first&part=1&cid=32533>> accessed 11 July 2015.

<sup>365</sup> Peter Stone, *EU Private International Law*, (Edward Elgar Publishing, England, 2010) at p352.

applicable had the express choice of law not been made.<sup>366</sup> Thus, the protections offered to consumers by the Unfair Terms in Consumer Contract Regulations,<sup>367</sup> Consumer Contracts (Information, Cancellation and Additional Charges) Regulations<sup>368</sup> and the Electronic Commerce (EC Directive) Regulations,<sup>369</sup> which implement the corresponding EU instruments,<sup>370</sup> could not be excluded. These will be explored later.

The UCC adopts a slightly different approach to the protection of consumers: where there is an active choice of law it is ineffective unless it bears a reasonable relation to the law of the principal residence of the consumer.<sup>371</sup> The EU rule provides stronger protection in that it requires equivalence rather than merely approximation. Furthermore it should be noted that the current protection available to EU citizens is stronger than that previously available under the Rome Convention 1980<sup>372</sup> following recognition by the European Court<sup>373</sup> that provisions should protect the party who is less experienced in economic and legal matters.<sup>374</sup>

Where activities are located outwith the EU the courts will determine the appropriate governing law by considering a number of factors, including the place of performance<sup>375</sup> or where the necessary actions are required to conclude the contract<sup>376</sup> i.e. the subject matter of the dispute.<sup>377</sup> Owing to the worldwide nature of e-commerce, particularly the services offered by exchanges, it is probable that determination of applicable law under this mechanism will be required. A starting point might be the terms and conditions in order to determine where characteristic performance is due. The place of performance may be where the place of payment into the exchange's "hosted wallet" is made or where the money is transferred out of the exchange. It should be noted that as a number of exchanges are located in Asia, applying the private international rules of place of performance may produce an unfavourable applicable law outcome for many individuals with money deposited with exchanges owing to the costs associated with commencing legal action in an unknown jurisdiction.

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<sup>366</sup> Art 6(2).

<sup>367</sup> Unfair Terms in Consumer Contracts Regulations 1999 (SI1999/2083).

<sup>368</sup> Consumer Contracts (Information, Cancellation and Additional Charges) Regulations 2013 (SI2013/3134) implemented the Directive on Consumer Rights (2011/83/EC) in the UK and replaced the Consumer Protection (Distance Selling) Regulations 2000 (SI2000/2334).

<sup>369</sup> The Electronic Commerce (EC Directive) Regulations 2002 (SI2002/2013).

<sup>370</sup> Unfair Consumer Contract Terms Directive 93/13/EEC; Consumer Rights Directive (2011/83/EC); Electronic Commerce Directive 2000/31/EC.

<sup>371</sup> § 1-301(e).

<sup>372</sup> Peter Stone, *EU Private International Law*, (Edward Elgar Publishing, England, 2010) p351.

<sup>373</sup> *Shearson Lehman Hutton v TVB* [1993] ECR I-139, at para 18 [1993] I.L.Pr.199

<sup>374</sup> Peter Stone, *EU Private International Law*, (Edward Elgar Publishing, England, 2010) p123

<sup>375</sup> Brussels 1 Regulation, Art 5(1).

<sup>376</sup> Rome Convention, Art 5(2).

<sup>377</sup> *Actor sequitur forum rei*: the pursuer must have access to the court where the subject matter of the dispute is situated.



#### 4.5: Choice of court

A brief examination of choice of court rules is required. From an analysis of several sets of exchange terms and conditions, many terms and conditions fail to clearly identify either the governing law or the jurisdiction of the courts.<sup>378</sup> Where there is an express choice of court clause this will be given effect to.<sup>379</sup> However, in the absence of express choice of court provisions private international law dictates the application of general rules dependent upon the locality of the contracting parties.<sup>380</sup> Where both parties and the activities are located within the EU, the Brussels I Recast Regulation<sup>381</sup> stipulates that persons domiciled in a member state shall be sued in the courts of that member state regardless of whether they are nationals<sup>382</sup> of the member state.<sup>383</sup> Where different member states have concurrent jurisdiction over the same dispute, the court first seized of the action will have jurisdiction to determine the case.<sup>384</sup> The concept of domicile for the purposes of Brussels 1 Recast is an autonomous one which is more akin to ordinary or habitual residence rather than the common law concept of domicile within the United Kingdom. Owing to the single market in the EU this clearly dictates a suitable mechanism for identifying the forum for disputes or the jurisdiction for governance of the terms and conditions in the absence of express agreement of the parties. Application of Brussels I Recast is therefore required in the absence of express choice of court provisions. However, as identified, the anonymity associated with crypto-currencies and exchanges may result in difficulties in ascertaining the domicile and habitual residence of the parties so the application of Brussels I Recast will not be entirely straightforward.<sup>385</sup>

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<sup>378</sup> For example see *Appendix 2C (ANXBTC)*.

<sup>379</sup> Brussels 1 Regulation was recast by EU Regulation No. 1215/2012 of the European Parliament and of the Council on jurisdiction and the recognition and enforcement of judgements in civil and commercial matters and entered into force on 10 January 2015. Brussels 1 Recast at paragraph 22.

<sup>380</sup> See *Appendix 2 (Terms and Conditions)*. The terms in *Appendix 2C (ANXBTC)* does not contain an express choice of court provision and therefore the rules considered in this section will be applicable.

<sup>381</sup> Brussels 1 Regulation, effective from 1 March 2002. Brussels 1 Regulation was recast by EU Regulation No. 1215/2012 of the European Parliament and of the Council on jurisdiction and the recognition and enforcement of judgements in civil and commercial matters and entered into force on 10 January 2015.

<sup>382</sup> Brussels 1 Regulation, Art 2(1) and 2(2).

<sup>383</sup> This is the general rule but there are specific rules in relation to contract in Art 7. In relation to a contract the place of performance determines which courts have jurisdiction. That raises all the questions of place of performance. Art 7 goes on to determine that in relation to service contracts is the place of performance of those services. However in relation to consumer contracts art 18 provides a consumer can bring an action either where the provider is domiciled or where he is domiciled and proceedings may only be brought against a consumer where he is domiciled. Given the nature of the services being provided by an exchange it is unlikely that they will sue the consumer because the consumer is not obliged to provide any ongoing performance. Rather it will be the consumer suing the exchange for failure to return funds to the consumer or implement payment instructions. Such proceedings accordingly can be raised in the place where the consumer is domiciled but ultimately that judgment would require to be enforced where the exchange is domiciled.

<sup>384</sup> E Crawford and J Carruthers, *International Private Law: A Scots Perspective*, (3<sup>rd</sup> Edition, W. Green, London, 2010) at 155

<sup>385</sup> Peter Stone, *EU Private International Law*, (Edward Elgar Publishing, England, 2010) at p134 – 137.

As noted above in relation to the choice of court, there are special jurisdictions in relation to a contract. A person domiciled in a member state may be sued in another member state in the courts for the place of performance of the obligation.<sup>386</sup> That again raises the issue of whether repayment is due at the consumer's end or at the exchange end. In relation to consumers they may bring proceedings in either the member state in which they are domiciled or that other member state where the other party undertakes business.<sup>387</sup> However where a consumer is sued they may be sued only in the member state where they are domiciled.<sup>388</sup> It is unlikely the consumer will be sued as performance of the obligations remains with the exchange and it is more likely that consumer may be forced to take action when their exchange fails to implement their obligations.

#### 4.6: Prorogation agreements

The Brussels 1 Recast Regulation recognises party autonomy – the right of the contracting parties to make an effective choice of court in terms of the contract itself or a specific agreement at the time a dispute arises. However the Regulation expressly excludes application to agreements which instead refer matters to arbitration.<sup>389</sup> The Brussels 1 Recast Regulation amended related actions (or *lis pendens*)<sup>390</sup> provisions where there is a contractual exclusive jurisdiction clause. The amendments aimed to address the problems seen in the *West Tankers*<sup>391</sup> litigation<sup>392</sup> where the English courts issued an anti-suit injunction in support of arbitration proceedings in the UK which failed to stop the Italian courts becoming first seized in terms of the original Brussels 1 Regulation. The new provisions allow a member state court specified in an exclusive jurisdiction clause to proceed to determine a dispute even if proceedings have commenced first (in breach of contract) before another member state court. Therefore the other member state court is required to stay proceedings to allow the exclusive jurisdiction court to determine the issue.

Arbitration in consumer contracts is uncommon; in the example terms and conditions of exchanges there is no such provision. However, there exists, within the UK financial services sector, broadly stated a statutory right on the part of the consumer to refer a dispute to the

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<sup>386</sup> Art7(1)(a).

<sup>387</sup> Art18(1).

<sup>388</sup> Art18(2).

<sup>389</sup> art 1(2)(d).

<sup>390</sup> A Anton et al, *Private International Law*, (3<sup>rd</sup> Edition, W.Green, Edinburgh, 2011) at 258.

<sup>391</sup> *General Assicurazioni Generali SpA v West Tankers Inc* [2009] 1 AC 1138; [2009] 3 WLR 696.

<sup>392</sup> Further proceedings in the case are reported at *West Tankers Inc v Allianz SpA (formerly known as Riunione Adriatica Scurta) & Anor* [2012] EWHC 454 (Comm); [2012] 1 C.L.C. 762.

Financial Ombudsman Service [FOS].<sup>393</sup> It is a form of alternative dispute resolution and is not a court proceeding nor is there any agreement to refer the matter to arbitration. It does determine the civil rights of the financial services provider<sup>394</sup> but not the consumer unless the consumer accepts the findings. The process of exchange of written information and determination generally without an oral hearing has been held to be compliant with the provider's right to a fair hearing in determination of its civil rights and obligations.<sup>395</sup> The Court of Appeal has held in *In Focus*<sup>396</sup> that where a consumer accepted a settlement through the FOS this amounted to *res judicata* when the consumer subsequently sought to sue the defendants for the balance of the claim which exceeded the FOS limits. Accordingly, the English courts apparently treat a FOS decision as the equivalent to the decision of a court or the outcome of an arbitration. In contrast in Scotland, Lord Woolman in the Outer House held that the taking of a case to the FOS was not arbitration which would have the effect of interrupting the running of prescription in relation to a claim made against the defenders.<sup>397</sup> Instituting court proceedings or the reference to arbitration of a dispute would have that effect. As a result it appears that the Scottish and English courts presently take differing views on the effects of FOS determining a case. It is suggested the existence of a statutory right for a consumer to have a claim determined by FOS is not arbitration nor should it be regarded as a court process and that *In Focus* is wrongly decided. Accordingly if some ombudsman-like ADR process were incorporated into exchange contracts as part of a scheme of regulation that right may potentially fall within the scope of Brussels 1 Recast, should it be construed as arbitration but not apparently where it is regarded as a form of alternative dispute resolution, albeit compulsory for one of the parties. The current position where the Scottish and English courts take differing views on the nature of such remedies merely illustrates the potential for confusion.

The existence of such a right would not prevent proceedings being taken by an exchange to the detriment of a consumer in a country outwith the jurisdiction clause in the terms and conditions – as was seen in *West Tankers*. The amendments in Brussels 1 Recast allow the court which has jurisdiction in terms of the choice of court provisions to determine the issue and the court first seized must stay<sup>398</sup> their proceedings and defer to the court of choice to

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<sup>393</sup> The Dispute Resolution: Complaints Block of FCA Sourcebook [DISP] provisions for referral to FOS <<http://fshandbook.info/FS/html/handbook/DISP/INTRO/1>> accessed 11 July 2015. These expand the statutory outline contained in Part XVI of Financial Services and Markets Act 2000.

<sup>394</sup> Financial Services and Markets Act 2000 s228(5).

<sup>395</sup> Article 6 European Convention on Human Rights and Fundamental Freedoms, *Heather Moor and Edgecomb v UK* 2011 ECtHR App 1550/09.

<sup>396</sup> *Clark v In Focus Asset Management* [2014] EWCA Civ 118; [2014] 1 WLR 2502.

<sup>397</sup> *Clark v Argyle Consulting Limited* 2011 SLT 180.

<sup>398</sup> Sist in Scotland.

accept or reject the validity of that choice. Such a route for alternative dispute resolution will be discussed later.<sup>399</sup>

The foregoing examination of private international law aspects is necessary to consider at a preliminary step in order that it can be determined what the governing law is and which courts have jurisdiction in order that the appropriate substantive consumer protections imposed as a matter of law according to the governing law applicable through express choice of law or implied as discussed above into B2C contracts can be considered. In the following sections it will be assumed that the governing law is one of the legal systems of the UK.

#### 4.7: Unfair Terms

The B2C nature of the contracts under consideration dictates that the terms and conditions and provision of services<sup>400</sup> in relation to crypto-currencies, particularly bitcoin, result in those terms and conditions falling under the ambit of the Unfair Contract Terms Act 1977<sup>401</sup> (“UCTA”) and Unfair Terms Consumer Contracts Regulations 1999<sup>402</sup> (“UTCCR”). UCTA applies to contract terms or notices that seek to limit or exclude liability and certain types of liability can never be excluded in consumer contracts, such as liability for fraud, death or personal injury.

The UTCCR<sup>403</sup> introduced a definition of “unfair” in relation to consumer contracts which are expressed in a standard form (namely, a term which has not been individually negotiated) contrary to the requirement of good faith which causes a significant imbalance in the parties’ rights and obligations arising under the contract to the detriment of the consumer.<sup>404</sup> This is often referred to as the fairness test. In *Director General of Fair Trading v First National Bank*<sup>405</sup> it was concluded that the determinative elements of the test were the application of good faith and a significant imbalance between the parties. The former requires open and fair dealing by the business to the consumer. Accordingly terms should be expressed fully, clearly and legibly, with no contractual pitfalls or traps placed on the parties. This includes any attempts by the service provider to exclude or limit liability for fraud. Fraud liability can never be excluded in consumer contracts and attempts to do so will be unsuccessful. Additionally the seller or business should not take advantage of the lack of knowledge or experience of the consumer.

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<sup>399</sup> In *Chapter 6 (Recommendations & Conclusions)*.

<sup>400</sup> As detailed in *Chapter 2 (Money)* at 2.5 (*Conclusion*) crypto-currencies cannot be considered money.

<sup>401</sup> Unfair Contract Terms Act 1977 c50.

<sup>402</sup> SI 1999/2083.

<sup>403</sup> This transposes into UK law the Unfair Terms in Consumer Contracts Directive 93/13/EEC of 5 April 1993 OJ L 95/29.

<sup>404</sup> Art 3(1) of the Unfair Terms in Consumer Contracts Directive and Regulation 5(2) of UTCCR. There is a “grey list” of terms which are prima facie unfair in the schedule to the Regulations.

<sup>405</sup> [2001] UKHL 52. This case considered application of the 1994 regulations which were subsequently replaced by the Unfair Terms in Consumer Contracts Regulations 1999.

An examination of the terms and conditions of the three sample exchanges is required to assess the application of these principles in practice.<sup>406</sup> The three selected terms and conditions represent three of the largest exchanges in operation and also permit analysis of exchanges located outwith the UK

These examples appear to have been assembled from “off the shelf” terms and largely fail to detail the type of services provided or to tailor the obligations of either party to make reference to the provision of exchange services.<sup>407</sup> The terms and conditions<sup>408</sup> contain extensive limitation of liability provisions which fail to balance the risks to the consumers depositing the funds against those risks undertaken by the online exchange providing the service – the balance is firmly in favour of the exchanges. For example, BTC.sx’s terms and conditions of use<sup>409</sup> include a broad indemnity in favour of BTC.sx in respect of use of the website and as a consequence use of the services provided by BTC. This is illogical considering the provision of services is by BTC.sx to the consumer. The same terms and conditions include an extensive limitation of liability clause, including a cap limited to the fees paid by the consumer in the foregoing 12 month period. As the fees paid by the consumer can be minor compared to the sums deposited this is highly restrictive for investors and demonstrates there is no effective recourse, should the exchange encounter problems or losses.<sup>410</sup> Conversely the terms of bitstamp.net<sup>411</sup> are more consumer friendly enabling the consumer to recoup sums from bitstamp.net. The limitation is capped at the greater of either the total amount held on account<sup>412</sup> for the member (less commission) or 125% of the amount of the transactions that are subject to the claim. However, the terms do include an uncapped indemnity in favour of bitstamp.net and no reciprocal provisions in favour of the consumer. Finally, as demonstrated by the recent significant problems at bitstamp.net<sup>413</sup> consumers should carefully consider the exchange which exchange in which to deposit their crypto-currency.<sup>414</sup>

The inability to influence the terms of the contract, even if the consumer has had the opportunity to review them prior to entering into the contract means that the terms have not

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<sup>406</sup> The terms and conditions from the example exchanges are contained in Appendices 2A – 2C.

<sup>407</sup> <<https://btc.sx/about/terms-privacy/>> accessed 11 July 2015.

<sup>408</sup> <<https://anxbtc.com>> accessed 11 July 2015 and <[www.bitstamp.net](http://www.bitstamp.net)> accessed 11 July 2015.

<sup>409</sup> *Appendix 2 (Terms and Conditions)*.

<sup>410</sup> As explored in detail in *Chapter 1 (Crypto-Currencies)* at 1.4 (*Case Studies*).

<sup>411</sup> *Appendix 2 (Terms and Conditions)*.

<sup>412</sup> As defined in the terms and conditions.

<sup>413</sup> This is discussed *Chapter 1 (Crypto-Currencies)* at 1.2 (*Operation*).

<sup>414</sup> There is acknowledgment of the issues associated with hosted wallets in the bitcoin industry. Companies are now actively involved in creating more resilient technology to better protect users and create additional checks for depositing and withdrawal of funds from hosted wallets. For further information see Daniel Cawrey, *Should Bitcoin Users Trust Hosted Wallets?* (Coindesk, USA, 17 August 2014) <<https://www.coindesk.com/bitcoin-users-trust-hosted-wallets/>> accessed 11 July.

been individually negotiated<sup>415</sup> and will be considered accordingly in light of the UTCCR and UCTA. Additionally, the indemnities and limitations of liability would not be enforced in the EU as a result of the significant imbalance which they create. This is true either where the governing law is within a member state or where the business activities are directed towards the EU or any member state.

#### 4.8: E-commerce

The Electronic Commerce (EC Directive) Regulations 2002<sup>416</sup> transposed the E-Commerce Directive<sup>417</sup> into UK law and govern the requirements as to provision of information by online traders to consumers. Online traders are required to provide certain information about themselves and about how the contracts concluded through electronic means will be implemented, including acknowledgement of receipt of the order in a timely manner.

The DTI guidance on the Electronic Commerce (EC Directive) Regulations 2002<sup>418</sup> states, “*the requirement for an information society service to be ‘normally provided for remuneration’ does not restrict its scope to services giving rise to buying and selling online. It also covers services (insofar as they represent an economic activity) that are not directly remunerated by those who receive them, such as those offering online information or commercial communications (e.g. adverts) or providing tools allowing for search, access and retrieval of data.*”<sup>419</sup>

The Regulations will apply where, for example, the consumer does not pay for the transmission of crypto-currency funds and the miner is rewarded by the creation of new bitcoins for the block in which the transaction is contained. Should a dispute arise the Regulations also apply the principle of country of origin to the determination of the legal proceedings. However, this principle is not extended to the terms of consumer contracts under the Regulations. In practical terms, this means that a UK company selling products to UK citizens and consumers of other member states must ensure that its terms and conditions comply with the laws of the other member states in which the goods and services are sold. Thus, exchanges are obliged to ensure that their terms and conditions comply with the laws of the countries where the crypto-currencies can be bought and exchanged. Owing to the

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<sup>415</sup> This was the decision in *UK Housing Alliance (North West) Ltd v Francis* [2010] EWCA Civ 117.

<sup>416</sup> Consumer Rights (Payment Surcharges) Regulation SI 2012/3110.

<sup>417</sup> 2000/31/EC.

<sup>418</sup> A Guide for Business to the Electronic Commerce (EC Directive) Regulations 2002 (SI 2002/2013) July 2002 <<http://webarchive.nationalarchives.gov.uk/20121212135622/http://www.bis.gov.uk/files/file14635.pdf>> accessed 11 July 2015.

<sup>419</sup> A Guide for Business to the Electronic Commerce (EC Directive) Regulations 2002 (SI2002/2013) July 2002 at page 9, at 2.13 <<http://webarchive.nationalarchives.gov.uk/20121212135622/http://www.bis.gov.uk/files/file14635.pdf>> accessed 11 July 2015.

anonymity of the users of exchanges it will be difficult to determine the country of origin<sup>420</sup> of many users. It is outwith the scope of this thesis to examine compliance of the crypto-currency terms and conditions with national laws where the crypto-currency services are provided outwith the EU. However, it appears unlikely that the sample terms and conditions following the examination above, will comply with the national laws of the member states. Should the proposed draft European Sales Law<sup>421</sup> progress to become a European instrument<sup>422</sup> and replace the current e-commerce rules, then it is likely that exchanges would take advantage of the provisions of the European sales laws which permit that law to be adopted as an alternative to the national laws of the member states. This would remove the need to comply potentially with 28 different jurisdictions.

In terms of the current EU regulations minimum information<sup>423</sup> is required which is to be easily, directly and permanently accessible on the service providers' website. This includes the name and geographical address of the service provider, details, including the e-mail address or other address to allow direct and effective communication should a consumer have difficulties with the website, a company number,<sup>424</sup> any supervisory body or professional body if a regulated profession, and a VAT number. The example terms and conditions in the Appendices clearly lack some of this key information. These rules are relatively straightforward to comply with and non-compliance suggests consumers may not be adequately protected should problems with exchanges arise. For example, should a consumer require to sue an exchange the absence of geographical address details may frustrate that intention.

#### 4.9: Distance Selling

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<sup>420</sup> Note earlier discussion regarding worldwide use of crypto-currencies and difficulties ascertaining underlying users.

<sup>421</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions a common European Sales Law to Facilitate cross-border transactions in a single market (COM/2011/0636 final) <<http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:52011DC0636>> accessed 11 July 2015.

<sup>422</sup> The Law Societies Joint Brussels Office, *Brussels Agenda*, March 2015 <<http://www.lawscot.org.uk/media/455103/brusselsagenda-march2015.pdf>> accessed 11 July 2015.

<sup>423</sup> Art 6(1) of Electronic Commerce (EC Directive) Regulations 2002

<sup>424</sup> This overlaps with the requirement in the Companies Act 2006 if the service provider is a company. The Companies Act 2006 requires that the place of registration should be stated alongside the company number. As noted above, this is lacking in several of the crypto-currency exchange terms and conditions and the ultimate body is unclear. This is clearly insufficient for the purposes of the Companies Act 2006 and the E-Commerce Regulations.

The Consumer Rights Directive<sup>425</sup> was partially transposed<sup>426</sup> into the UK by the Consumer Contracts (Information Cancellation and Additional Charges) Regulations 2013.<sup>427</sup> The Directive aimed to consolidate, harmonise and regulate distance selling rules. This section will analyse the prior legislation and compare that against the recent amendments under the Consumer Contracts (Information, Cancellation and Additional Charges Regulations 2013.

The Consumer Rights Directive applies to distance contracts - that is those which are concluded without the simultaneous physical presence of the trader and the consumer.<sup>428</sup> However financial services transactions are excluded from its operation.<sup>429</sup> These are defined as any service of a banking, credit, insurance, personal pension, investment or payment nature.<sup>430</sup> Insofar as crypto-currency transactions involve any element of payment, then they are excluded from the protections of the Consumer Rights Directive and its transposition into the domestic laws of member states.<sup>431</sup> As noted, the recent view of Kokott AG<sup>432</sup> that bitcoin is neither goods nor services but a payment mechanism and would therefore be excluded from the Consumer Rights Directive. On the other hand, the lodging of funds in an online wallet is not a banking transaction for the reasons explored<sup>433</sup> and therefore does fall within the scope of the Directive.

Instructing an exchange to make a payment from funds previously lodged as bitcoins may amount to payment and therefore would be excluded. However, for the reasons explored in *Chapter 3 (Payment)* it is not free from doubt that crypto-currency payments would meet the legal tests for payment. If a crypto-currency payment is not legally regarded as payment then the payments themselves would not be excluded either.

The Consumer Protection (Distance Selling) Regulations 2000<sup>434</sup> applied to contracts concluded on or before 12 June 2014. Where an account with an exchange was opened prior to that date the 2000 Regulations would continue to apply. From 13 June 2014 onwards the

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<sup>425</sup> 2011/83/EU.

<sup>426</sup> The remaining provisions are implemented in the Consumer Rights (Payment Surcharges) Regulations 2012 and the Enterprise Act 2002 (Part 8 EU Infringements) Order 2013).

<sup>427</sup> SI 2013/3134.

<sup>428</sup> Consumer Rights Directive art 2(7).

<sup>429</sup> Consumer Rights Directive art 3(3)(d).

<sup>430</sup> Consumer Rights Directive art 2(12).

<sup>431</sup> The measure is a maximum harmonisation instrument art 1 and art 4. As a result it should be uniformly implemented throughout the EU.

<sup>432</sup> Case C-264/14 opinion of Kokott AG issued on 16 July 2015 <<http://curia.europa.eu/juris/document/document.jsf?jsessionid=9ea7d2dc30d555012c6119454c778d85909bf51a8d1d.e34KaxiLc3qMb40Rch0SaxuQbNj0?text=&docid=165919&pageIndex=0&doclang=FR&mode=lst&dir=&occ=first&part=1&cid=604912>> accessed on 3 August 2015.

<sup>433</sup> In *Chapter 2 (Money)* at 2.1 (*Deposit*).

<sup>434</sup> SI 2000/2334.



Consumer Contracts (Information, Cancellation and Additional Charges) Regulations 2013<sup>435</sup> apply to consumer contracts. As the majority of crypto-currency transactions are B2C the implementation of these Regulations to transactions with exchanges must be considered. Consumers are provided with a right to cancel the contract within a 14 day time period. However, the Consumer Rights Directive<sup>436</sup> allows an exception to the right to withdraw where the price is dependent on fluctuations in the financial market which cannot be controlled by the trader and which may occur within the withdrawal period. Application of this exception depends on whether upon transfer from a fiat currency to a crypto-currency the exchange is relying on a financial market to predict the value. Each exchange is operating its own OTC offering to its customers as there is no universal trading market for crypto-currencies. The hosted wallets are closed to the individual exchanges and so the exchange will determine the price it will provide in exchange.<sup>437</sup> Thus, the right to withdraw arguably exists in relation to crypto-currency transactions. This is at odds with the founding principles of crypto-currencies that once a transaction is processed through the Blockchain it cannot be reversed. The right to cancel however does not make the transaction conditional. The cancellation returns the parties to the original position as a separate inverse transaction.<sup>438</sup> Accordingly there is no breach of the Blockchain protocol. A second transaction is required to reverse the first. If, as noted above, crypto-currency payments are not regarded legally as payment then those transactions too would be liable to cancellation. Reliance on consumer protection against exchanges has not yet been considered by the courts so the foregoing analysis is presently entirely theoretical. Nonetheless it is an avenue where consumers may find adequate protection and the ability to cancel transactions.<sup>439</sup>

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<sup>435</sup> Implementing the Consumer Rights Directive.

<sup>436</sup> Article 16(b).

<sup>437</sup> The fluctuations in over the counter volumes was apparent over a period of 3 months where Mt Gox quoted prices up to 20% higher than its main competitors bitstamp.net and BTC.sx. This led to the opportunity to arbitrage and take advantage of purchasing at the lower prices on the exchanges and selling for higher prices on Mt Gox. For further discussion see Joon Ian Wong, *Why Mt. Gox, the World's First Bitcoin Exchange, is Dying* (Coindesk, USA, 8 February 2014) <<https://www.coindesk.com/mt-gox-first-bitcoin-exchange-dead/>> accessed 11 July 2015.

<sup>438</sup> *Robertson's Electrical Ltd v Customs and Excise Commissioners* 2006 SC 261

<sup>439</sup> Although one English firm of Solicitors, Selachii, a sole practitioner based in London, apparently obtained an injunction against Ryan Kennedy the principal of Moolah Ltd on a common law basis on behalf of those who had deposited 750 bitcoins when Moolah was experiencing financial difficulties. John Weru Maina, *Selachii LLP Consolidates its position as UK's Leading Bitcoin Law Firm* (Cryptonews, USA, 15 March 2015) <<https://www.cryptocoinsnews.com/selachii-llp-consolidates-position-uks-leading-bitcoin-law-firm/>> accessed 11 July 2015.

#### **4.10: Conclusions**

This chapter has provided an examination of the relationship between exchanges and consumers. As a necessary preliminary, consideration was given to the application of private international law rules to the services of exchanges in relation both to the governing law and appropriate forum in which disputes between the parties might be resolved. The impact of those private international law rules would be seen in the governing law which in turn may operate to enhance both the level of protections available to consumers as well as the potential avenues of redress for them.

It is highly unlikely the FCA or another regulatory body would be able to satisfy themselves that the providers of exchanges terms and conditions currently comply with the High Level Principles for Business [PRIN] within the FCA Handbook, in particular the generalised duty to treat customers fairly. Should the provision of exchange services become a regulated activity under Financial Services and Markets Act 2000 [FSMA] then the terms and conditions would require amendments to comply with PRIN. This would require providers to clearly specify the services being provided in language readily understandable to users. Furthermore they would be unable to rely on terms which distorted the economic balance between the parties which would therefore be deemed to be unfair and unenforceable against consumers.

In the absence of bespoke legislation, the application of the existing directives as presently transposed into domestic law, does not appear to offer a suitably comprehensive series of protections to consumers. At present the unfair and/or unenforceable terms and conditions have the potential to mislead consumers as to their legal rights thus demonstrating market imperfections resulting from information asymmetry. Expansion and amendment of the regulations and directives would be required to bring the services of exchanges into the remit of the legislation. The following chapter aims to consider further regulation of exchanges at both national and international level. Thereafter, the thesis will conclude with recommendations based on the outcomes and shortcomings of this chapter.

## Chapter 5: Regulation

### 5.1: Overview

The UK has a comprehensive and mature system of regulation in relation to the provision of financial services by recognised financial institutions and others. While that system is constantly refined by legislative changes and subordinate rules it has, to date, not addressed the issues posed by crypto-currencies. This chapter will examine the points of contact between the current regime and crypto-currencies drawing on experiences elsewhere and attempts by regulators to equate such currencies with known and established principles and categories of products. In order to determine what, if any, regulatory regime ought to be applied to crypto-currencies it is necessary to consider why regulation is implemented and assess if the features for regulatory intervention are apparent in crypto-currencies. As the exchange of crypto-currencies are transactions of a financial nature the chapter will then consider the mature regulatory regime applicable to the UK financial services. This chapter will therefore consider *why regulation* is undertaken and thereafter consider the UK model of protection. *Chapter 6 (Recommendations & Conclusions)* will then assess any gaps in the regulatory structure and explore extension of regulation to crypto-currencies and exchanges.

### 5.2: Why Regulate?

The objectives of regulation - what outcome regulation is trying to secure – is distinct from the rationale for regulation and the reasons for regulation in practice. This section proposes to analyse and balance the objectives, rationale and reasons for regulation of the financial services at national and European levels. Owing to the extensive of literature on regulation this chapter will focus on the reasons for regulation of the financial services sector. “*We regulate finance over and above the way we regulate other industries because finance exhibits market failures that can have devastating consequences.*”<sup>440</sup> Regulation of financial institutions is expansive and actively enforced owing to the negative ramifications for consumers should these financial institutions fail. A lack of confidence in financial institutions directly impacts on the propensity of consumers to invest and spend in the economy, thereby indirectly affecting connected industries. Aims of regulation<sup>441</sup> are to: (i) sustain systemic

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<sup>440</sup> The Warwick Commission, The University of Warwick, *Why Regulate* (undated) <[http://www2.warwick.ac.uk/research/warwickcommission/financialreform/report/chapter\\_1.pdf](http://www2.warwick.ac.uk/research/warwickcommission/financialreform/report/chapter_1.pdf)> accessed 11 July 2015.

<sup>441</sup> The Financial Services Authority was subject to a number of statutory duties to secure the regulatory objectives under the Financial Services and Markets Act 2000. The regulatory objectives, detailed in s2 included, market confidence, public awareness, protection of consumers and the reduction in financial crime.

stability; (ii) maintain the safety and soundness of financial institutions; and (iii) protect consumers.<sup>442</sup> This section will examine each in relation to financial services.

### 5.2.1: Systemic stability

Firstly, as noted in the foregoing chapters, one response of the UK government to the 2008 economic crisis and the perception of the performance of the FSA in the run up to that crisis was the division of the FSA into the FCA and the Prudential Regulation Authority [PRA].<sup>443</sup> The FSA Chief Executive noted the advantage of this approach, “[*twin peaks*]<sup>444</sup> will embed the forward-looking, judgement-based approach from the old reactive style of regulation. The changes will not just be structural but involve behavioural shifts from both supervisors and firms.”<sup>445</sup> The split model resulted in deposit takers, insurers and major investment firms having two groups of supervisors, one focusing on macro prudential regulation (PRA) and one focusing on conduct (FCA). All other firms (i.e. those not “dual regulated”) are solely supervised by the FCA focusing on regulating conduct. The FCA focus on supervising and regulating how financial institutions are conducting the regulated activities which comprise their businesses and ensure systemic stability through territory guidance in the FCA Handbook from high level principles<sup>446</sup> to sector specific guidance.<sup>447</sup> These high level principles ensure that businesses are sustainable and prevent undue risk taking. The stability flows from the FCA Handbook and implementation of the rules by financial institutions. As the FCA has the power to censure<sup>448</sup> impose financial penalties<sup>449</sup>, suspend,<sup>450</sup> prohibit,<sup>451</sup> order redress<sup>452</sup>, bring criminal proceedings<sup>453</sup> or take other action to prevent market abuse,<sup>454</sup> financial

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The succeeding bodies, Financial Conduct Authority and the Prudential Regulation Authority were created under the Financial Services Act 2012. The statutory objectives are detailed in sections 1B – 1D for the Financial Conduct Authority and section 2B onwards for the Prudential Regulation Authority.

<sup>442</sup> David Llewellyn, *The Economic Rationale for Financial Regulation*, 1999, FSA Occasional Papers in Financial Regulation at p7.

<sup>443</sup> The FSA released publications outlining the approach to be taken by two new bodies in papers dated 15 and 16 October 2012.

<sup>444</sup> Michael Taylor, *Redrawing the regulatory map: A proposal for Reform* (1997) JFRC 5(1), 49–57; Michael Taylor (1995) *Twin Peaks: A Regulatory Structure for the New Century*, Centre for the Study of Financial Innovation, London and Michael Taylor (1996) *Peak Practice: How to Reform the UK's Regulatory System*, Centre for the Study of Financial Innovation.

<sup>445</sup> Hector Sants, FSA Chief Executive (March 2012).

<sup>446</sup> E.g. as discussed in the foregoing chapters PRIN and FIT block of the Handbook.

<sup>447</sup> E.g. ICOBS (Insurance: Conduct of Business sourcebook); MCOB (Mortgages and Home Finance: Conduct of Business sourcebook); BCOBS (Banking: Conduct of Business sourcebook).

<sup>448</sup> FSMA s205.

<sup>449</sup> FSMA s206.

<sup>450</sup> FSMA s206A.

<sup>451</sup> FSMA ss207-208.

<sup>452</sup> FSMA s404 et seq.

<sup>453</sup> FSMA s401.

<sup>454</sup> FSMA ss118-119.

institutions are compelled to comply with the FCA Handbook and principles. In November 2014 the FCA used its powers to fine Citibank.<sup>455</sup> HSBC Bank,<sup>456</sup> JPMorgan Chase Bank<sup>457</sup> The Royal Bank of Scotland<sup>458</sup> and UBS AG<sup>459</sup> collectively £1,114,918,000<sup>460</sup> for failures in controlling business practices in their G10 spot Foreign Exchange [FX] trading operations. More recently, the FCA has imposed a fine of £284,432,000 on Barclay's Bank for a breach of Principle 3 (management and control) by failing to take reasonable care to organise and control its affairs responsibly and effectively in relation to FX trading operations.<sup>461</sup> The FCA considered this market systemically important and failures by regulators to adequately monitor these industries should cease. At the time of investigation FX exchanges were not subject to any specific regulation. The FCA action demonstrates the ability to impose fines outwith FCA regulated activities and the level of fines demonstrates the extent of enforcement using the high level Principles for Businesses.<sup>462</sup> The fines imposed reflect the desire for transparent markets in the UK. If crypto-currencies become authorised then standards of market conduct, such as treating customers fairly in PRIN would apply.

The provision of services by exchanges is not stable. The recent outage<sup>463</sup> on bitstamp.net affected the entire bitcoin network. Bitstamp's system problems resulted in quoted prices of bitcoin becoming inaccurate, with some products suspended. The CEO of DigitalTangible explained that users of bitcoin on her site were shown incorrect prices following the bitstamp outage.<sup>464</sup> The increasing centralisation of economic power and influence amongst key players in the provision of services in which bitstamp is a key exchange, indicates that problems with

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<sup>455</sup> FCA Final Notice 2014: Citibank N.A. 12 November 2014 <<http://www.fca.org.uk/your-fca/documents/final-notices/2014/citibank-na>> accessed 11 July 2015.

<sup>456</sup> FCA Final Notice 2014: HSBC Bank Plc, 12 November 2014 <<http://www.fca.org.uk/your-fca/documents/final-notices/2014/hsbc-bank-plc>> accessed 11 July 2015.

<sup>457</sup> FCA Final Notice 2014: JPMorgan Chase Bank N.A. 12 November 2014 <<http://www.fca.org.uk/your-fca/documents/final-notices/2014/jpmorgan-chase-bank>> accessed 11 July 2015.

<sup>458</sup> FCA Final Notice 2014: The Royal Bank of Scotland plc, 12 November 2014 <<http://www.fca.org.uk/your-fca/documents/final-notices/2014/royal-bank-of-scotland>> accessed 11 July 2015.

<sup>459</sup> FCA Final Notice 2014: UBS AG, 12 November 2014 <<http://www.fca.org.uk/your-fca/documents/final-notices/2014/ubs-ag>> accessed 11 July 2015.

<sup>460</sup> FCA Press Release, FCA fines five banks £1.1 billion for FX failings and announces industry-wide remediation programme, November 2014 <<http://www.fca.org.uk/news/fca-fines-five-banks-for-fx-failings>> accessed 11 July 2015.

<sup>461</sup> FCA Final Notice 2015: Barclays Bank PLC, 20 May 2015 <<https://www.fca.org.uk/your-fca/documents/final-notices/2015/barclays-bank-plc>> accessed 11 July 2015.

<sup>462</sup> *Legal & General v FSA* Financial Services and Markets Tribunal 13 March 2005 first established that the PRIN block of the then FSA Handbook was directly enforceable in relation to disciplinary action. Available at <[http://www.fsa.gov.uk/pubs/other/legal\\_general.pdf](http://www.fsa.gov.uk/pubs/other/legal_general.pdf)> paragraphs 27 and 28, accessed 11 July 2015

<sup>463</sup> As discussed in chapter 1 bitstamp.net suffered a significant security breach on 5 January 2015 and temporarily suspended services until 9pm on 9 January 2015. Detailed discussion is in Chapter 1.

<sup>464</sup> Pete Rizzo, *Bitcoin ecosystem feels far reaching effects bitstamp outage*, (Coindesk, USA, 6 January 2015) <<http://www.coindesk.com/bitcoin-ecosystem-feels-far-reaching-effects-bitstamp-outage/>> accessed 11 July 2015.

these major players could result in systemic failure within the bitcoin industry if not in the general financial markets, given the currently small size of the former. The CEO of DigitalTangible acknowledged the risks explaining “....*what you’re seeing is a lot of systemic risk in the bitcoin ecosystem.*”<sup>465</sup> Following the outage, bitcoin experienced continuing volatility in its market price, with a drop of 27% in a matter of hours in mid-January 2015.<sup>466</sup> This was inextricably linked to the bitstamp outage.<sup>467</sup> These ongoing difficulties are demonstrative of systemic failings in the crypto-currency network and provide evidence for regulatory intervention. However, the systemic issues associated with crypto-currencies and exchanges are restricted to the crypto-currency network. The outage and failures have not extended to other financial institutions.

### **5.2.2: Safety and soundness of financial institutions**

Secondly, the introduction of the PRA, a subsidiary of the Bank of England, was intended to provide a supervisory arm independent from the FCA. The PRA provides macro prudential regulation to ensure the failure of one institution does not lead to the failure of others because of the interconnectedness of the financial markets and financial institutions. The provision of independent protection creates a previously absent check on financial institutions and enables an independent analysis outwith the FCA. Prudential regulation offers economies of scale in monitoring financial institutions as a whole. Often individuals and consumers are not in a position to make judgements about the security of their banks, because they lack the specialist knowledge or sector specific insight to judge the safety and soundness of financial firms they are investing in. For example, in the collapse of Northern Rock consumers were unaware of the Northern Rock’s inability to borrow funds on the 90 day LIBOR market until early in the financial crisis with the so called “Run on the Rock.” A mass run on deposits, such as experienced by Northern Rock, will lead banks to become vulnerable to an imbalance in cashflow out while the assets held, largely mortgages are long loans which cannot be readily liquidated to match the cash outflows. Any bank, particularly a mortgage bank, is vulnerable to a run on capital as they borrow short and lend long e.g. LIBOR 90 day money compared

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<sup>465</sup> As quoted in Pete Rizzo, *Bitcoin ecosystem feels far reaching effects bitstamp outage*, (Coindesk, USA, 6 January 2015) <<http://www.coindesk.com/bitcoin-ecosystem-feels-far-reaching-effects-bitstamp-outage/>> accessed 11 July 2015.

<sup>466</sup> Yessi Bello Perez, *Bitcoin’s Price Drop in the Headlines*, (Coindesk, USA, 15 January 2015) <<http://www.coindesk.com/bitcoins-price-drop-headlines/>> accessed 11 July 2015 and Alex Hern, *Bitcoin price plunge sparks new crash fears*, (The Guardian, London, 14 January 2015) <<http://www.theguardian.com/technology/2015/jan/14/bitcoin-price-plunge-sparks-new-crash-fears>> accessed 11 July 2015.

<sup>467</sup> Alex Hern, *Bitcoin price plunge sparks new crash fears*, (The Guardian, London, 14 January 2015) <<http://www.theguardian.com/technology/2015/jan/14/bitcoin-price-plunge-sparks-new-crash-fears>> accessed 11 July 2015.

with mortgage repayments over 25 years. The introduction of the Basel III Accord <sup>468</sup> aimed to improve the banking sector's ability to absorb shocks arising from financial and economic stress by strengthening banks' transparency and disclosures. Basel III accordingly reforms<sup>469</sup> targeted both micro prudential regulation, helping the resilience of individual banking institutions in periods of stress, and macro prudential measures, designed to tackle potential systemic risks thereby reducing the ability of banks to damage the economy through excessive risk taking. These reforms bolstered the minimum capital requirements which banks were required to maintain to ensure future financial crises did not occur.<sup>470</sup> Of course exchanges currently fall outwith the regulated sector and are not subject to any capital adequacy requirements. In fact they may simply use the funds deposited by their customers as a source of capital to fund their own activities and expansion plans.

Regulation introduces minimum standards, which if actively enforced, promote the safety and soundness of financial institutions and remove weaker players from the market which in turn increases consumer confidence. As noted by Llewellyn, *"it is not unknown for producers in an industry to welcome regulation if it keeps low-quality producers out of the market."*<sup>471</sup> By introducing regulation, consumers are provided with confidence in the services available which provides greater assurance and further investment. The introduction of regulation in the field of crypto-currencies would elevate crypto-currency transactions to provide confidence in the services available and remove the association with illegal activities.

### **5.2.3: Consumer Protection**

Finally, owing to consumers' desire for sufficient safeguards, the introduction of regulation would offer consumers protection. Consumers reasonably expect protection to be afforded so few will be aware of the lack of regulatory protections available should problems with exchanges occur. Consumers have already experienced detriment in losses by exchanges through alleged hacks or technological difficulties.<sup>472</sup> The absence of any mechanisms

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<sup>468</sup> Basel III is a global, voluntary regulatory framework on bank capital adequacy, stress testing and market liquidity risk. Basel Committee on Banking Supervision, *Basel III: A global regulatory framework for more resilient banks and banking systems*, December 2010 (new June 2011) available at <<http://www.bis.org/publ/bcbs189.pdf>> accessed 11 July 2015.

<sup>469</sup> Basel Committee on Banking Supervision, *Basel III: A global regulatory framework for more resilient banks and banking systems*, December 2010 (new June 2011) available at <<http://www.bis.org/publ/bcbs189.pdf>> accessed 11 July 2015.

<sup>470</sup> Basel III was introduced in the EU through the capital requirements directives: Directive 2013/36/EU on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms and Regulation (EU) No 575 / 2013 on prudential requirements for credit institutions and investment firm replaced Directive 2006/49/EC which was designed to implement Basel II.

<sup>471</sup> David Llewellyn, *The Economic Rationale for Financial Regulation*, 1999, FSA Occasional Papers in Financial Regulation at p26.

<sup>472</sup> Further examples are detailed in *Chapter 1 (Crypto-currencies)* at 4.5 (*Case Studies*).

available to consumers to quantify capital adequacy of exchanges and the associated risks of insolvency, of fraudulent misappropriation of funds or the susceptibility of the exchange to a cyber-attack suggests a lack of transparency. While the absence of any safety nets, in the shape of compensation schemes or the implicit guarantee of government as lender of last resort to exchanges suggests inadequate consumer protection is presently available to those who have lodged funds. If these risks cannot be quantified then there is clear evidence of information asymmetry.<sup>473</sup> Additionally there is no single market in bitcoins, with each exchange operating on an OTC basis. Furthermore users are locked into the provision of services with that provider as a result of the nature of the online wallets and the underlying cryptographic characteristic of the public key/private key infrastructure of crypto-currencies. Although there is transparency of price offered by exchanges in relation to the conversion to and from crypto-currencies, there is no ready mechanism by which to work out if the price is competitive compared with other exchanges. Transparency is key in financial services to enable an informed comparison of competitors' services. This has the potential for actual consumer detriment. As noted, one of the key reasons for regulation is to provide adequate consumer protection. In the writer's opinion this evidence of actual and potential consumer detriment justifies regulatory intervention.

### **5.3: UK Regulatory Model**

#### **5.3.1: Overview**

While the foregoing section provides an overview of the basis for regulation this section will now provide an overview of UK regulation and ways in which it protects consumers and prevents systemic failure. It will then analyse attempts to fight financial crime, the regulated activities and protection offered to consumers – attributes key when considering the work undertaken by exchanges.

FSMA<sup>474</sup> repealed the previous statutes regulating financial services providers and the services they provided including the Financial Services Act 1986<sup>475</sup> and the Banking Act 1987.<sup>476</sup> This signified an alteration to the regulatory culture of financial services in the UK. Prior to FSMA, the protections available to investors were largely an inadequate, complex web of self-regulation, an institutional approach, which failed to effectively offer investor protection.

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<sup>473</sup> This is where one party has more information than another and there is an imbalance of powers in the relationship. This is evident in crypto-currency relationships.

<sup>474</sup> Financial Services and Markets Act 2000 c8.

<sup>475</sup> Financial Services Act 1986 c60.

<sup>476</sup> Banking Act 1987 c22.



FSMA was thus, “....broadly welcomed for enhancing investor protection and eliminating the complex system of overlapping self-regulatory organisations that previously existed.”<sup>477</sup>

To achieve visible and effective investor protection regulation, FSMA<sup>478</sup> adopted a functional approach in relation to its key statutory objectives of: (i) consumer protection; (ii) integrity of UK financial institutions and markets while securing effective competition in the interests of consumers.<sup>479</sup> The functional approach is perhaps most clearly seen in the general prohibition<sup>480</sup> from undertaking financial services<sup>481</sup> without the necessary authorisation.<sup>482</sup> An understanding of these statutory objectives and their implementation will be key for exploring the potential extension to governance of crypto-currencies and exchanges. FSMA also introduced governance by the independent body the FSA to meet the key objectives through an impartial regulator.<sup>483</sup> The FSA, the repurposed Securities and Investment Board, assumed its new role in December 2001 and continued to regulate financial services until 1 April 2013.

As a more considered response to the Banking Crisis in 2008<sup>484</sup> the UK coalition Government<sup>485</sup> introduced the Financial Services Act 2012<sup>486</sup> to ensure that “close supervision is [provided] because bank failures ... have wide-ranging external effects – on depositors,

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<sup>477</sup> Eilas Ferran and Charles Goodhurt (eds), *Regulating Financial Services and Markets in the Twenty First Century*, (Hart Publishing, Oxford, 2002) at – Colin Mayer, *Regulating Principles and the Financial Services and Markets Act 2000* at p25

<sup>478</sup> As amended by the Financial Services Act 2012 c21. The original objectives in FSMA were contained in ss2-6 and included: market confidence, financial stability, public awareness, the protection of consumers; and the reduction of financial crime. Following the introduction of the Financial Services Act 2012 these were modified to separate functions between the PRA and the FCA.

<sup>479</sup> Financial Services and Markets Act 2000 c8 at section 1B. The original regulatory objectives in the FSMA also covered consumer education and the reduction of financial crime.

<sup>480</sup> FMSA s19.

<sup>481</sup> FSMA s22.

<sup>482</sup> FSMA s20.

<sup>483</sup> Michael Taylor, *Redrawing the regulatory map: A proposal for Reform (1997) JFRC 5(1), 49–57*; Michael Taylor (1995) *Twin Peaks: A Regulatory Structure for the New Century*, Centre for the Study of Financial Innovation, London and Michael Taylor (1996) *Peak Practice: How to Reform the UK's Regulatory System*, Centre for the Study of Financial Innovation.

<sup>484</sup> The initial response was the Banking (Special Provisions) Act 2008 and the Banking Act 2009. This was latterly replaced by the Financial Services Act 2012.

<sup>485</sup> “It is still early days in the aftermath of the financial crisis. Bankers, depositors, businesses, regulators and governments are all adjusting in their own ways. All concerned have a role in rebuilding confidence and a robust system. The authorities should move rapidly to establish the right framework for regulation of the financial system, including competition policy and the reach of the state safety net. But there should be no rush to all-embracing new legislation. Changes to the rules must not only strengthen the banking system but reinforce confidence and the competitive position of the British banks and the City.” as stated by the House of Lords, Select Committee on Economic Affairs, 2<sup>nd</sup> Report of Session 2008 – 2009, *Banking Supervision and Regulation*. Volume 1: Report. 2 June 2009 at p7.

<sup>486</sup> Financial Services Act 2012 c21. The previous administration had enacted the Banking (Special Provisions) Act 2008 c2, the Banking Act 2009 c1 and the Financial Services Act 2010 c28.

*taxpayers, other financial institutions, businesses and the economy as a whole ....*<sup>487</sup> As noted, the 2012 Act<sup>488</sup> largely retained the provisions in FSMA but restructured the FSA, dividing its powers between two bodies, namely; the FCA and the PRA. The FCA subsumed the FSA's regulatory objectives in relation to micro-prudential regulation, including product regulation and conduct of business rules so that markets and financial systems remain sound, stable and resilient.<sup>489</sup> Following the financial crisis, it was considered vital to have 'twin peaks' model of supervision and the PRA<sup>490</sup> was to be the independent body responsible for the macro-prudential regulation and supervision of banks, building societies, credit unions, insurers and major investment firms to promote the safety and soundness of these firms given the stability these institutions provide to the UK financial system. The key aim was to mitigate the risk of systemic failures.<sup>491</sup> Regulation by the FCA and PRA is the cornerstone to the functional approach introduced in FSMA which, read in conjunction with amending legislation, provides comprehensive consumer protections. The following sections will consider the application of the current regime to crypto-currencies and the services provided to exchanges. Where possible it will consider extension of the regulation to crypto-currencies and exchanges.

## 5.4: Fighting Financial Crime

### 5.4.1: Money Laundering

The perceived affinity of crypto-currencies with criminal activities has captured the public imagination in the UK, Europe and the USA, "*....the bit coin [sic] is music to the ears of global criminals because it is an illegal 'currency' and will be used for a massive amount of money laundering....*"<sup>492</sup> The anonymous, or pseudo anonymous,<sup>493</sup> nature of crypto-currencies offers opportunities to the criminal fraternity looking to launder the proceeds of crime and facilitate criminal activities with tracing the provenance at best difficult. The Financial Action Task Force

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<sup>487</sup> House of Lords, Select Committee on Economic Affairs, 2<sup>nd</sup> Report of Session 2008 – 2009, Banking Supervision and Regulation. Volume 1: Report. 2 June 2009 at p7.

<sup>488</sup> This act built on the immediate response to the crisis – the Banking (Special Provisions) Act 2008 c2

<sup>489</sup> Financial Services and Markets Act 2000 s1B (The FCA's General Duties). Further information about the aims and objectives of the FCA is available online at <<http://www.fca.org.uk/about>> accessed 11 July 2015

<sup>490</sup> The FCA Handbook is available to view at <<http://www.fshandbook.info/FS/>> accessed 11 July 2015. Note, the Handbook creates binding obligations on firms. For those unfamiliar with the FCA Handbook an overview document is available at <<http://www.fca.org.uk/static/documents/handbook/readers-guide.pdf>> accessed 11 July 2015.

<sup>491</sup> <<http://www.bankofengland.co.uk/pr/pages/default.aspx>> accessed 11 July 2015.

<sup>492</sup> Sally Ramage, *Bitcoins - kiss of death to us all in the developed world*, Crim. Law. 2014, 220, 1 – 2 at 1.

<sup>493</sup> As discussed in Chapter 1 (Crypto-currencies) at 1.3.5 (Money Laundering).

[FATF]<sup>494</sup> issued guidance and Recommendations<sup>495</sup> on combatting money laundering in general. The FATF recently produced crypto-currency specific anti-money laundering guidance which reaffirmed that international co-ordination is required to enhance the effectiveness of the international anti-money laundering standards.<sup>496</sup> Countries, competent authorities and financial institutions<sup>497</sup> are expected to identify, assess and understand Money Laundering and Terrorist Financing risks and take appropriate measures to effectively mitigate these risks. This guidance extends to traditional and increasingly novel transactions types, including the use of crypto-currencies. The FATF Recommendations have significantly influenced regulation in the prevention of money laundering and terrorist financing at both European and national levels. The significance of the FATF Recommendations is affirmed by article 7(3) of the United Nations Convention against Transnational Organised Crime 1999,<sup>498</sup>

<sup>494</sup> An inter-governmental body established by G7 in 1989. Members include, United Kingdom, USA, China, Canada, Japan, France, Hong Kong and Germany amongst others. Objectives include: set standards and promote effective implementation of legal, regulatory and operational measures for combating money laundering, terrorist financing and other related threats to the integrity of the international financial system. FATF has developed a series of Recommendations for combatting money laundering and terrorist financing. These are recognised as an international standard and have formed the basis for regulatory advancements in money laundering. Further information is available at FATF website at <<http://www.fatf-gafi.org/pages/aboutus/>> accessed 11 July 2015. While FATF is independent it is hosted by the Organisation of Economic Co-operation and Development [OECD].

<sup>495</sup> FATF Guidance, *International Standards on combating money laundering and the financing of terrorism and proliferation*, February 2012 <[http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF\\_Recommendations.pdf](http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf)> accessed 11 July 2015 and FATF Guidance, *Virtual Currencies*, June 2015 <<http://www.fatf-gafi.org/media/fatf/documents/reports/Guidance-RBA-Virtual-Currencies.pdf>> accessed 11 July 2015. While the FATF Guidance is not binding it is influential and used as a reference tool by the EU legislating in this area.

<sup>496</sup> FATF Guidance, *Virtual Currencies*, June 2015 <<http://www.fatf-gafi.org/media/fatf/documents/reports/Guidance-RBA-Virtual-Currencies.pdf>> accessed 27 June 2015.

<sup>497</sup> Financial institutions means any natural or legal person who conducts as a business one or more of the following activities or operations for or on behalf of a customer:

- (1) Acceptance of deposits and other repayable funds from the public
- (2) Lending
- (3) Financial leasing
- (4) Money or value transfer services
- (5) Issuing and managing means of payment (e.g. credit and debit cards, cheques, traveller's cheques, money orders and bankers' drafts, electronic money).
- (6) Financial guarantees and commitments
- (7) Trading in (a) money market instruments (cheques, bills, certificates of deposit, derivatives etc.); (b) foreign exchange; (c) exchange, interest rate and index instruments; (d) transferable securities; (e) commodity futures trading.
- (8) Participating in securities issues and the provision of financial services related to such issues
- (9) Individual and collective portfolio management
- (10) Safekeeping and administration of cash or liquid securities on behalf of other persons
- (11) Otherwise investing, administering or managing funds or money on behalf of other persons
- (12) Underwriting and placement of life insurance and other related insurance
- (13) Money and currency changing.

<sup>498</sup> Adopted by General Assembly resolution 55/25 of 15 November 2000 entered into force on 29 September 2003. Available at <<https://www.unodc.org/documents/treaties/UNTOC/Publications/TOC%20Convention/TOCebook-e.pdf>>

the “Palermo Convention,” which provides that, “...*in establishing a domestic regulatory and supervisory regime under the terms of this article, and without prejudice to any other article of this Convention, States Parties are called upon to use as a guideline the relevant initiatives of regional, interregional and multilateral organisation against money laundering.*”

Within the EU, the Third Money Laundering Directive<sup>499</sup> updated the framework designed to protect the integrity and stability of financial institutions against terrorist financing and money laundering risks. To incorporate both FATF’s revised Recommendations in February 2012<sup>500</sup> and EU reports identifying significant disparities in member states’ implementation of anti-money laundering initiatives,<sup>501</sup> a new Fourth Money Laundering Directive<sup>502</sup> has been approved which will replace the Third Money Laundering Directive.

Presently, the anti-money laundering regime in the UK is governed by the Money Laundering Regulations 2007<sup>503</sup> which transpose the provisions of the Third Money Laundering Directive.<sup>504</sup> These in turn incorporate FATF’s then amended 40 Recommendations and 9 Anti-Terrorist Recommendations.<sup>505</sup> The Third Money Laundering Directive sought to harmonise anti-money laundering and terrorist financing standards across Europe.<sup>506</sup> The

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accessed 11 July 2015. The list of signatory states can be found there. While China became bound earlier it secured an opt-out for Hong Kong with the British former colony only opting in from 27 September 2006.

<sup>499</sup> Directive 2005/60/EC of the European Parliament and of the Council of 26 October 2005

<sup>500</sup> The FATF Recommendations, *International Standard on combating money laundering and the financing of terrorism and proliferation*, February 2012 < [http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF\\_Recommendations.pdf](http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf) > accessed 11 July 2015.

<sup>501</sup> Report from the Commission to the European Parliament and the Council on the application of Directive 2005/60/EC on the prevention of the use of the financial system for the purpose of money laundering and terrorist financing < [http://ec.europa.eu/internal\\_market/company/docs/financial-crime/20120411\\_report\\_en.pdf](http://ec.europa.eu/internal_market/company/docs/financial-crime/20120411_report_en.pdf) > accessed 11 July 2015; EBA, ESMA and EIOPA’s Report on the legal and regulatory provisions and supervisory expectations across EU member states of Simplified Due Diligence requirements where the customers are credit and financial institutions under the Third Money Laundering Directive [2005/60/EC], April 2012 < [http://www.esma.europa.eu/system/files/jc\\_2011\\_097.pdf](http://www.esma.europa.eu/system/files/jc_2011_097.pdf) > accessed 24 May 2015.

<sup>502</sup> On 20 May 2015 the European Parliament adopted, at second reading, the Council position at first reading on the proposed Fourth Money Laundering Directive. The directive will enter into force on the 20<sup>th</sup> day following its publication in the Official Journal i.e. 26<sup>th</sup> June 2015. Member states will then have two years to transpose into national legislation.

<sup>503</sup> SI 2007/2157 replacing the Money Laundering Regulations 2003 SI 2003/3075.

<sup>504</sup> The First Money Laundering Directive (Council Directive 91/308/EEC of 10 June 1991 on prevention of the use of the financial system for the purpose of money laundering) dealt with laundering of proceeds of drug-related offences through the financial system; The Second Money Laundering Directive (Council Directive 2001/97/EC of 4 December 2001 amending Council Directive 91/308/EEC on prevention of the use of the financial system against money laundering) aimed to cover all serious crime which were then both replaced and extended by the Third Money Laundering Directive (Directive 2005/60/EC of 26 October 2005 on the prevention of the use of the financial system for the purpose of money laundering and terrorist financing).

<sup>505</sup> Following the 9/11 Attack these additional anti-terrorist provisions were inserted. They were revised more recently in 2012.

<sup>506</sup> Peter Snowden and Simon Lovegrove, *Money Laundering Regulations 2007*, COB 2008, 54 (Mar), 1 – 38 at 4.

2007 Regulations are intended to protect the financial system rather than imposing penalties for non-compliance – therefore the approach is regulatory<sup>507</sup> rather than punitive. The Regulations apply only to relevant persons acting in the course of business.<sup>508</sup> This extends beyond credit institutions and financial institutions to include the business of high value dealers,<sup>509</sup> casinos,<sup>510</sup> and money remittance businesses.<sup>511</sup> The inclusion of these categories, beyond the traditional scope of credit and financial institutions, demonstrates an increasing awareness of the diversity of businesses engaged in high value money items requiring anti-money laundering provisions. These businesses are not overseen by a regulatory body such as the FCA but by HMRC.<sup>512</sup> This will be considered below.

Relevant persons, acting in the course of business, should take all reasonable steps including undertaking due diligence measures to avoid committing an offence under the regulations.<sup>513</sup> Customer Due Diligence [CDD] checks form the core obligations of taking “reasonable steps and due diligence” and must be undertaken by organisations for each client (unless exemptions apply). Put simply, CDD checks require confirmation of: (a) the customer’s identity – their name and address; (b) the verification of such through the production of data or documents from a reliable source and as an incidental result evidence of habitual residence; and (c) the obtaining of information as to the purpose and extent of the business relationship which is subject to ongoing industry guidance for sector specific checks providing recommendations for compliance with the regulations. Owing to the nature of the services provided by exchanges the third category is not applicable as they are creating the business relationship.

The regulations, mirroring the Third Money Laundering Directive, require CDD checks to be undertaken in five situations; 1) upon establishment of a business relationship; 2) where the customer is undertaking occasional transactions amounting to 15,000 euros (in the UK the equivalent is £10,000) or more, regardless of whether the occasional transactions are linked<sup>514</sup>; 3) where there is a suspicion of money laundering or 4) terrorist financing; and 5) where the organisation doubts the adequacy of the documentation provided. Additionally, the

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<sup>507</sup> Alastair Brown, *Money Laundering*, (Thomson Reuters (Legal) Limited, 2009) at p53.

<sup>508</sup> Regulation 3(1) defines relevant persons as including: credit institutions; financial institutions; auditors; independent legal professionals; estate agents; high value dealers and casinos.

<sup>509</sup> Defined in regulation 3(12). High value dealers is a firm or sole trader who by way of business trades in goods when he receives, in respect of an transactions, a payment or payments in cash of at least EUR 15,000. This definition of high value dealer is derived from Third Money Laundering Directive 2(1)(3)(e).

<sup>510</sup> Defined in regulation 3(14).

<sup>511</sup> SI 2007/2157 Schedule 1 para 4

<sup>512</sup> Her Majesty’s Revenue & Customs (HMRC) which regulates taxation in the UK.

<sup>513</sup> Regulation 45(4) “A person is not guilty of an offence under this regulation if he took all reasonable steps and used all due diligence to avoid committing the offence.”

<sup>514</sup> Definition of “High Value Dealer” in Regulations.

organisation should have ongoing monitoring as part of their CDD regime on a risk-sensitive basis throughout the business relationship and must act quickly should risks be identified. If the relevant person cannot comply with the CDD checks no business should be undertaken by the organisation on behalf of the relevant person until the organisation is satisfied of compliance. Additionally, the organisation should consider, if appropriate and based on the relevant person's failure to comply with CDD, if disclosure to the relevant authority in terms of section 330 of Proceeds of Crime Act 2002<sup>515</sup> [POCA] is required.<sup>516</sup>

The above procedure details the steps for standard CDD. The Regulations also provide for or enhanced CDD procedures where a higher risk is perceived<sup>517</sup> as there is recognition that, *"the risk of money laundering and terrorist financing is not the same in every case."*<sup>518</sup> Thus, simplified<sup>519</sup> CDD can be undertaken where the risk is minor e.g. the product being supplied is not capable or highly unlikely to be utilised by money launderers. Thus products which offer transactional facilities such as bank accounts and credit cards are perceived as risky in comparison with a life insurance bond which does not offer such services. By comparison, organisations should *"take specific and adequate measures to compensate for higher risk"* business and alter the CDD accordingly. The Regulations also place an obligation on organisations to *"establish and maintain"*<sup>520</sup> appropriate systems<sup>521</sup> to assist law enforcement agencies with investigations. In so doing, these appropriate systems will demonstrate regulatory compliance.

The anti-money laundering rules are applied by businesses of all natures in the regulated sector. However, this section will consider application of these requirements to the present situation of crypto-currencies and exchanges. The terms and conditions of one Hong Kong based exchange provider<sup>522</sup> suggest that it undertakes CDD checks at the outset of every business relationship<sup>523</sup> by requesting scans of documents proving identity and address. It does not require production of the originals or the production of those documents to a competent authority for authentication purposes. This would not meet contemporary UK or EU

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<sup>515</sup> c29. POCA replaced the Criminal Justice Act 1998 and 1993.

<sup>516</sup> Further information on POCA is detailed in the following section.

<sup>517</sup> Regulation 14.

<sup>518</sup> Regulation 13.

<sup>519</sup> Regulation 13.

<sup>520</sup> Regulation 20(4) provides, *"A credit or financial institution must establish and maintain system which enable it to respond fully and rapidly to enquiries from financial investigator accredited under section 3 of the Proceeds of Crime Act 2002 (accreditation and training), persons acting on behalf of the Scottish Ministers in their capacity as enforcement authority under that Act, officers of Revenue and Customs or constables as to (a) whether it maintains, or has maintained during the previous five years, business relationship with any person; and (b) the nature of that relationship."*

<sup>521</sup> Discussions of the relevant systems is unnecessary for the purposes of this thesis.

<sup>522</sup> <<https://anxbtc.com/>> accessed 24 May 2015.

<sup>523</sup> The terms and conditions are in Appendix 2C.

standards. The Hong Kong exchange implies it is registered under the Money Service Operators Licensing System at the Customs and Excise Department, Hong Kong and therefore requires confirmation and CDD to comply with the regulations of the Customs and Excise Department. It is noted that although the address provided by the Hong Kong exchange provider is registered to a Money Service Operator under the Hong Kong Customs and Excise Licensing System, the company name does not correspond to the exchange registered at this address in the online Customs and Excise Licensing System. This may reflect a cavalier approach to regulatory compliance. However, the Hong Kong company is, at least if the checks are invoked, introducing CDD checks suggesting a level of compliance with the FATF Recommendations.<sup>524</sup> The analysis of Silk Road and Liberty Reserve exchange providers<sup>525</sup> demonstrates that not all exchanges implement the FATF Recommendations to actively confirm the identity of users of exchanges before undertaking business on their behalf. As will be recalled, individuals registered under patently false names, including “Russia hackers”; “Hacker Account” and “Joe Bogus.”<sup>526</sup> The recent FATF guidance acknowledged that the underlying protocols of crypto-currencies do not require or provide identification or verification of consumers’ identities.<sup>527</sup> If the authorities extend the anti-money laundering measures to include the operations of exchanges, registration under such anonymous titles would be prohibited. This would assist in identification and monitoring of transactions to assist authorities identify suspicious activities.<sup>528</sup> Additionally, the implementation of CDD checks by exchanges would to an extent eliminate connections with illegality.

The preamble to the Fourth Money Laundering Directive states that, *“the soundness, integrity and stability of credit and financial institutions and confidence in the financial system as a whole could be seriously jeopardised by the efforts of criminals and their associates either to disguise the origin of criminal proceeds or to channel lawful or unlawful money for terrorist purposes.”*<sup>529</sup> In an attempt to launder money or finance terrorists, financiers or money launderers can utilise and exploit the freedom of capital movement and freedom to supply financial services across the EU. The EU acknowledged European intervention and

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<sup>524</sup> Hong Kong is one of the countries signed up to the FATF Recommendations. See further n437.

<sup>525</sup> Further information at *Chapter 1 (Crypto-currencies)* at 1.4.4 (*Case Study D: Liberty Reserve (Crypto-currency & exchange)*) and 1.4.3 (*Silk Road*) and 1.4.6 (*Silk Road 2*).

<sup>526</sup> The Financial Action Task Force (FATF) Report, *Virtual Currencies: Key Definitions and Potential AML/CFT Risks*, June 2014 <[www.fatf-gafi.org](http://www.fatf-gafi.org)> accessed 11 July 2015.

<sup>527</sup> The Financial Action Task Force (FATF) Guidance, *Virtual Currencies*, June 2015 at p11 <<http://www.fatf-gafi.org/media/fatf/documents/reports/Guidance-RBA-Virtual-Currencies.pdf>> accessed 11 July 2015.

<sup>528</sup> The Financial Action Task Force (FATF) Guidance, *Virtual Currencies*, June 2015 at p11 <<http://www.fatf-gafi.org/media/fatf/documents/reports/Guidance-RBA-Virtual-Currencies.pdf>> accessed 11 July 2015.

<sup>529</sup> The agreed text of the Fourth Money Laundering Directive <[http://www.europarl.europa.eu/meetdocs/2014\\_2019/documents/cj12/dv/draft\\_compromisetext\\_20150112/\\_draft\\_compromisetext\\_20150112\\_en.pdf](http://www.europarl.europa.eu/meetdocs/2014_2019/documents/cj12/dv/draft_compromisetext_20150112/_draft_compromisetext_20150112_en.pdf)> accessed 11 July 2015.



harmonisation was required to reflect and protect investors against criminals taking advantage of these technological advancements.<sup>530</sup> Thus, the effectiveness of anti-money laundering measures at European level should be increased to combat potential misuse of new technologies to conceal the true purpose of transactions.

At present however exchanges are not subject to the regulations at all. The Regulations apply to deposit taking institutions and money remittance businesses but for the reasons discussed in *Chapter 2* – the definitions in relation to deposit and money transmission are not satisfied by dealing in crypto-currencies and therefore exchanges fall outwith the regulatory sphere. However, as noted, the FATF have recently published guidance recommending that financial institutions should be required to comply with customer identification and verification for exchanging crypto-currencies as soon as such products / services are offered.<sup>531</sup>

Finally, for completeness, if an individual downloads an online wallet application to their own device and is in sole control of depositing funds and transferring them anti-money laundering checks are clearly not practical. However, should the application be altered and a third party becomes involved in hosting the online wallet then extension of the money laundering requirements to this area should be considered. For the purposes of this thesis, anti-money laundering checks where the wallet is hosted on the consumer's own device will not be considered further.

#### **5.4.2: Proceeds of Crime**

The Proceeds of Crime Act 2002<sup>532</sup> ("POCA") provides a series of offences for failing to make required reports of suspicion or knowledge of dealings in criminal property. POCA and the 2007 Money Laundering Regulations are closely related. Principally, under POCA there are a number of offences to combat dealings with criminal property. This section proposes to outline these offences and examine their potential application to owners or founders of exchanges.

The substantive money laundering offences are specified in Sections 327, 328 and 329 of POCA. Namely, if property is or represents the proceeds of crime it is criminal property<sup>533</sup> and a person knows or suspects that such property is criminal property then almost any act done by that person in relation to the property is an offence under one or more of these sections of

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<sup>530</sup> The agreed text of the Fourth Money Laundering Directive <[http://www.europarl.europa.eu/meetdocs/2014\\_2019/documents/cj12/dv/draft\\_compromisetext\\_20150112/\\_draft\\_compromisetext\\_20150112\\_en.pdf](http://www.europarl.europa.eu/meetdocs/2014_2019/documents/cj12/dv/draft_compromisetext_20150112/_draft_compromisetext_20150112_en.pdf)> accessed 11 July 2015.

<sup>531</sup> The Financial Action Task Force (FATF) Guidance, *Virtual Currencies*, June 2015 at p14 <<http://www.fatf-gafi.org/media/fatf/documents/reports/Guidance-RBA-Virtual-Currencies.pdf>> accessed 11 July 2015.

<sup>532</sup> c29. POCA replaced certain provisions of the Criminal Justice Acts 1988 and 1993 and extended the scope of the legislation while introducing some novel provisions.

<sup>533</sup> POCA 2002 s340.



POCA. Principally, under section 327 it is an offence to hold funds by concealing, disguising, converting, transferring or removing criminal property from the jurisdiction.<sup>534</sup> The court approved the proposition that “converts” includes “*any substitution, actual or constructive, in the quality or form of the property,*”<sup>535</sup> including exchanging for cash or goods.<sup>536</sup> Therefore the section does not require proof of purpose in order for actions to be included as offences.

POCA also introduces an offence if an individual enters into or becomes concerned in an arrangement which he knows or suspects facilitates or is intended to facilitate (by whatever means) the acquisition, retention, use or control of criminal property by or on behalf of another person.<sup>537</sup> There have been a number of cases interpreting this and it is accepted that the reason or purpose for the actions is not material to implementation.<sup>538</sup> Extension of the anti-money laundering regulation to crypto-currencies as recommended by FATF is therefore highly desirable given the use of crypto-currencies and exchanges for illegal purposes.

Section 329 clearly states that a person is committing an offence where he acquires criminal property, uses criminal property or has possession of criminal property. This applies where the individual knows or suspects the property to be criminal but does not include bona fide possession. Additionally, sections 330, 331 and 332 provide procedural offences and create reporting obligations for those in the regulated sector and detail the consequences of failing to report in accordance with the obligations. The regulated sector<sup>539</sup> includes businesses accepting deposits by a person, the activity of operating a bureau de change and transmitting money (or any representation of monetary value) by any means. It is possible these definitions of bureau de change and money transmitter could be amended to extend coverage to the business of crypto-currencies exchanges.<sup>540</sup> An offence under these sections requires knowledge, suspicion or reasonable grounds for suspicion of an offence.<sup>541</sup> This requires those in the regulated sector to be trained and aware of national guidance in order to hold suspicion or reasonable suspicion in accordance with this section, therefore providing an objective basis, albeit training is not a prerequisite of raising action. Failure to comply and

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<sup>534</sup> POCA 2002 s327(1)(a) – (e). As the UK comprises more than one jurisdiction the removal of funds from a Scottish bank account to an English bank account even in the same name would be sufficient to constitute the offence. The same is true of a conversion from a fiat currency to a crypto-currency.

<sup>535</sup> *R v Burden* [2007] EWCA Crim 863.

<sup>536</sup> Alastair Brown, *Money Laundering*, (Thomson Reuters (Legal) Limited, 2009) at p44.

<sup>537</sup> POCA s328 (Arrangements).

<sup>538</sup> See for example: *Squirrell Ltd v National Westminster Bank* [2006] 1 WLR 637; *R v Macmaster* [1999] 1 Cr. App. R. 402.

<sup>539</sup> Defined in Schedule 9 of FSMA.

<sup>540</sup> The UK Government has now confirmed it intends to extend these definitions when implementing the Fourth Money Laundering Directive into UK Law.

<sup>541</sup> What amounts to reasonable suspicion is explored in *R v Da Silva* [2006] EWCA Crim 1654 and more recently in *Shah v HSBC Private Bank (UK) Ltd* [2012] EWCH 1283 (QB).

make a disclosure to either a nominated officer or to the National Crime Agency (“NCA”) can result in convictions and the imposition of penalties and imprisonment. For example, in *R v Griffiths and Pattison*<sup>542</sup> the court imposed six months’ imprisonment on solicitors who failed to make a disclosure in relation to a conveyancing transaction for undervalue on behalf of a friend. Sections 331 and 332 make it an offence for nominated officers to fail to make the required reports to NCA. Accordingly there is comprehensive regulation regarding the anti-money laundering requirements and disclosures to the relevant authorities. A failure to disclose is a breach of POCA where the business is regulated, and could result in enforcement action by the authorities, the imposition of fines or prison sentences.

Additionally offences for tipping off<sup>543</sup> and failing to provide reasonable assistance to undertake investigations<sup>544</sup> are included. The FCA have the ability to prosecute, but have not prosecuted, offences under this provision of POCA.<sup>545</sup>

If exchanges fail to undertake CDD or suspect that the exchange is being used to launder proceeds of crime or criminal property, disclosure should be required to the relevant authorities. As noted above, following the Silk Road convictions in United States of America,<sup>546</sup> some exchanges are voluntarily introducing CDD provisions to legitimise the activities.<sup>547</sup> Whether this is adequate for the purposes of the Fourth Money Laundering Directive will require further in-depth analysis of the terms and conditions, practices and policies of exchanges alongside the provisions of the Fourth Money Laundering Directive.<sup>548</sup>

### 5.4.3: Market Abuse Directive

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<sup>542</sup> [2007] 1 Cr. App. R. (S.) 581 (95) CA.

<sup>543</sup> POCA 333A.

<sup>544</sup> POCA, Part 8.

<sup>545</sup> See *R v Neil Rollins* [2010] UKSC39. The court held that the FSA (the predecessor to the FCA) had the power to prosecute criminal offences under POCA. Rollins argued that the criminal offences should be restricted to those specifically referred to in FSMA s401 and 402. However, the court held that the FSA (now the FCA) had the power to prosecute money laundering offences under s327 as every person had the right to bring a private prosecution. A corporation could bring a prosecution, provided that it was permitted to do by the instrument that gave it the power to act. It is not clear that these powers of the FCA extend to the right to prosecute in Scotland where this is in the hands of the Crown Office and Procurator Fiscal Service.

<sup>546</sup> Although as previously noted, criminal sanctions cannot be imposed to the same extent in the UK.

<sup>547</sup> This will assist in due diligence by banks when accepting business from exchanges owing to the perceived affiliation with illegality.

<sup>548</sup> Chapter 6 (*Recommendations & Conclusions*) will further examine these areas and provide further conclusions.

As part of the EU Financial Services Action Plan,<sup>549</sup> the Market Abuse Directive,<sup>550</sup> introduced in 2003, aimed to ensure that a single market in securities to control insider trading was further harmonised and a regime to control market manipulation introduced. The importance of these regulations, and the continuing nature of market abuse allegations, results in this remaining a key area of regulation. In terms of the original Market Abuse Directive [MAD] and the UK regime the LIBOR<sup>551</sup> and FX<sup>552</sup> markets fell outwith the scope of the regime. These have both been the subject of market manipulation scandals<sup>553</sup> which the FCA has addressed by claiming breaches of the PRIN block of the Handbook.<sup>554</sup> Within the UK, commodity markets such as LME<sup>555</sup> and ICE Futures,<sup>556</sup> formerly the International Petroleum Exchange, were regulated as commodity exchanges under FSMA<sup>557</sup> which continued notwithstanding the absence of any reference to such markets in MAD. This provides a model for regulation of crypto-currency exchanges. If crypto-currencies are considered as commodities or commodity-money rather than money they might be subject to regulation under FSMA s118 and s118A on this basis. Similarly, if purely financial exchanges can be brought within the scope of market abuse controls, exchanges operating their own OTC operations might arguably be brought under market abuse controls. Many of the features of crypto-currencies and the trading in them have the hallmarks of commodity trading. If there is a market made in a crypto-currency it might be subject to market abuse.

Around the world examples can be found of regulators treating bitcoins and altcoins as commodities and asserting jurisdiction over players in those markets. The now insolvent US

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<sup>549</sup> The Financial Action Plan was introduced as part of the Lamfalussy Directive and process. Further information on the Financial Action Plan is available at <[http://ec.europa.eu/finance/general-policy/actionplan/index\\_en.htm#maincontentSec1](http://ec.europa.eu/finance/general-policy/actionplan/index_en.htm#maincontentSec1)> accessed 11 July 2015 and information regarding the Lamfalussy Directives is available at <[http://ec.europa.eu/finance/securities/lamfalussy/transposition/index\\_en.htm](http://ec.europa.eu/finance/securities/lamfalussy/transposition/index_en.htm)> accessed 11 July 2015.

<sup>550</sup> 2003/6/EC.

<sup>551</sup> London Inter Bank Offer Rate.

<sup>552</sup> Foreign exchange.

<sup>553</sup> FCA imposed fines on numerous banks including, Lloyds Banking Group fined £105m for serious LIBOR and other benchmark failings, 28 July 2014 <<http://www.fca.org.uk/static/documents/final-notice/lloyds-bank-of-scotland.pdf>> accessed 11 July 2015; Barclays fined with £290m fine over LIBOR fixing in 2012. This resulted in the Government requesting Martin Wheatley, managing director of the FSA and CEO-designate of the FCA to undertake an independent review into the setting and usage of LIBOR. The completed report is available at <[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/191762/wheatley\\_review\\_libor\\_finalreport\\_280912.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/191762/wheatley_review_libor_finalreport_280912.pdf)> accessed 11 July 2015. The first criminal trial against the first LIBOR defendant has commenced in London. Jennifer Rankin, *First Libor defendant faces trial in London*, (The Guardian, London, 25 May 2015) <<http://www.theguardian.com/business/2015/may/25/libor-trial-trader-tom-hayes?CMP=EMCNEWEML661912>> accessed 11 July 2015.

<sup>554</sup> See earlier information regarding the PRIN block of the Handbook.

<sup>555</sup> London Metal Exchange <<https://www.lme.com/>> accessed 11 July 2015.

<sup>556</sup> ICE Futures Market <<https://www.theice.com/futures-europe>> accessed 11 July 2015.

<sup>557</sup> FSMA Part XVIII

bitcoin mining company, GAW Miners introduced an altcoin which they termed paycoin.<sup>558</sup> In order to promote the currency they undertook to buy back the currency at \$20. Where the market price was less than this, GAW Miners were clearly at risk from large scale arbitrage with their “guarantee.”<sup>559</sup> This undertaking disappeared after intervention by the US Commodity Futures Trading Commission.<sup>560</sup> The commissioner considered that bitcoins and other altcoins were commodities and the Commission accordingly had a locus to intervene as the price guarantees amounted to market manipulation. The US approach offers a possible model for intervention in the UK. A further example can be seen by the Realcoin announcement in July 2014 of a new crypto-currency backed by the firm’s dollar reserves.<sup>561</sup> It was envisaged that Realcoin would not experience volatility in value owing to the pegging against the promoting firm’s dollar reserves. However, offering a crypto-currency, backed by its own company with no fluctuation raises questions of market abuse or rigging.<sup>562</sup> Owing to the lack of regulation such a structure can exist with a lack of independent oversight unless a creative and interventionist approach is adopted by regulators such as that noted above by the Commodity Futures Trading Commission. What is true of commodities would be equally true of derivative contracts based on those underlying commodities. As a result options, futures and contracts for differences based on crypto-currencies create the same range of issues.

At this juncture it should be noted that market manipulation alone is in play in relation to crypto-currencies and there is no prospect of the other aspect of market abuse - insider dealing, with the definition of insider requiring the possession of price sensitive confidential information which originated within the organisation contained in the legislation. These factors and the potential extension of the legislation, or amendments thereto will be further analysed in the next chapter.

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<sup>558</sup> Stan Higgins, *GAW Miners and the Disappearing \$20 Paycoin Floor*, (Coindesk, USA, 7 January 2015) <<http://www.coindesk.com/gaw-miners-paycoin-disappearing-20-floor/>> accessed 11 July 2015.

<sup>559</sup> Stan Higgins, *GAW Miners and the Disappearing \$20 Paycoin Floor*, (Coindesk, USA, 7 January 2015) <<http://www.coindesk.com/gaw-miners-paycoin-disappearing-20-floor/>> accessed 11 July 2015.

<sup>560</sup> Nermin Hajdarbegovic, *Commissioner Claims CFTC Can Intervene in Bitcoin Markets*, (Coindesk, USA, 18 November 2014) <<http://www.coindesk.com/commissioner-claims-cftc-can-intervene-bitcoin-markets/>> accessed 11 July 2015.

<sup>561</sup> Nermin Hajdarbegovic, *Brock Pierce Announces Dollar-backed Cryptocurrency “Realcoin”* (Coindesk, USA, 9 July 2014) <<http://www.coindesk.com/brock-pierce-announces-dollar-backed-cryptocurrency-realcoin/>> accessed 11 July 2015.

<sup>562</sup> Market stabilisation activities are permitted in limited circumstances where there is a new issue, it is disclosed in advance that it may operate, that it operates for no more than 28 days and that there is full disclosure to the market after the expiry of the safe harbour provision of the details of the support operation.

The FCA assumed responsibility for dealing with market abuse in the UK.<sup>563</sup> Under FSMA market abuse is committed when a person engages in any one or more of the seven behaviours<sup>564</sup> listed in s118 in relation to qualifying investments.<sup>565</sup> Regulation provides a secondary offence of taking, or refraining from taking, action which requires or encourages another person to engage in behaviour which would be market abuse if the encourager had carried out the behaviour.<sup>566</sup> Additionally the FCA published the MAR block<sup>567</sup> of the Handbook<sup>568</sup> providing guidance on practices which it considers amount to market abuse.<sup>569</sup>

The FCA has the ability to impose penalties and lifetime bans from the financial services industry following participation in market abuse. As examined<sup>570</sup> the diminishing pool of miners controlling crypto-currency development offers the opportunity for market abuse. However crypto-currencies are not listed as qualifying investments under FSMA. To do so would require amendment to the legislation. Whether the UK could act alone or whether this would require to be achieved at EU level is discussed further in this chapter.

## 5.5: Regulated Activities

The foregoing analysis highlighted areas of business of the regulated sector, including those accepting deposits and acting as money transmitters. This section will consider these regulated activities and consider if the actions of exchanges should, as a matter of policy, become regulated activities.

### 5.5.1: Deposits

As identified in the foregoing chapters, the retention of crypto-currencies in exchange hosted wallets can be equated with acceptance of deposits by those exchanges. The exchanges encourage individuals to retain funds in the hosted wallets for ease of use and regularly refer to payments into the hosted accounts as “deposits.”<sup>571</sup>

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<sup>563</sup> S118 regime goes further than criminal sanctions in 1993 Criminal Justice Act and allows FCA to take disciplinary action.

<sup>564</sup> The Government explanatory notes explain that broadly these are behaviours that are based on information generally not available to the rest of the market; that the behaviour is likely to give the regular market under a false or misleading impression; or that the regular user would be likely to regard the behaviours as behaviour that would distort the market.

<sup>565</sup> s118(1)(a).

<sup>566</sup> FSMA s123(1)(b).

<sup>567</sup> Market Abuse section of the handbook.

<sup>568</sup> As required by FSMA - FSMA s119.

<sup>569</sup> < <http://fshandbook.info/FS/html/FCA/MAR> > accessed 11 July 2015.

<sup>570</sup> In *Chapter 1 (Crypto-Currencies)*.

<sup>571</sup> See Appendix 2B: Bitstamp’s Terms of Use.

Ferran and Goodhurt acknowledge that, “....*technological developments open up markets and access to information to new investors but they also represent new risks, or perhaps old risks in a more intense form.*”<sup>572</sup> This section aims to consider if crypto-currencies are effectively governed by deposit regulation, or rather if, as suggested, old risks are created in a new, more intense form outwith the scope of legislation.

The Banking Act 1987 applied a uniform system of regulation to banks and other deposit takers (other than building societies) overseen by the Bank of England. This has now been subsumed into the scheme first adopted for investment business by the 1986 Act<sup>573</sup> by FSMA. The functional approach adopted by FSMA, as noted earlier, is best demonstrated in the general prohibition that no person may carry on a *regulated activity* in the UK,<sup>574</sup> nor purport to do so unless he is either an authorised person; or an exempt person.<sup>575</sup> Trading without authorisation is a criminal offence<sup>576</sup> and any agreements made by a person in the course of carrying on a regulated activity, in contravention of the general prohibition are unenforceable against the other party.<sup>577</sup> However, the consumer may enforce the terms against the person carrying on a regulated activity and is entitled to recover compensation for any losses sustained. What constitutes a regulated activity is therefore critical to determining the applicability of the deposit regime to crypto-currencies.

Section 22 and Schedule 2 of FSMA detail those activities which amount to a regulated activity. Paragraph 22 of Schedule 2 identifies deposits as a regulated activity, thus “*rights under any contract under which a sum of money (whether or not denominated in a currency) is paid on terms under which it will be repaid, with or without interest or a premium, and either on demand or at a time or in circumstances agreed by or on behalf of the person making the payment and the person receiving it*” amount to a deposit and thus a regulated activity. Additionally, the Financial Services and Markets Act 2000 (Regulated Activities) Order, as

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<sup>572</sup> Eilas Ferran and Charles Goodhurt (eds), *Regulating Financial Services and Markets in the Twenty First Century* (Hart Publishing, Oxford 2002) at p4.

<sup>573</sup> Financial Services Act 1986 c60.

<sup>574</sup> This raises the problem of the geographical position of the activities i.e. The locus of where the work is undertaken etc.

<sup>575</sup> Section 19 (The General Prohibition)

- (1) No person may carry on a regulated activity in the United Kingdom, or purport to do so, unless he is –
  - (a) An authorised person; or
  - (b) An exempt person.
- (2) The prohibition is referred to in this Act as the general prohibition.

<sup>576</sup> Financial Services and Markets Act 2000 section 23. This includes, on summary conviction imprisonment not exceeding six months or a fine not exceeding the statutory maximum, or both. And on conviction on indictment, imprisonment for a term not exceeding two years or a fine, or both.

<sup>577</sup> Financial Services and Markets Act 2000 sections 26, 27 and 29.

amended<sup>578</sup> (“RAO”) contains additional provisions as to the acceptance of deposits. Accepting deposits is a regulated activity if – (a) money received by way of deposit is lent to another; or (b) any other activity of the person accepting the deposit is financed wholly, or to a material extent, out of the capital or interest on money received by way of deposit.<sup>579</sup> The RAO details what a deposit is i.e. a sum of money which will be repaid, with or without interest or premium, and either on demand or at a time or in circumstances agreed by or on behalf of the person making the payment and the person receiving it.

If the activity is deemed a *regulated activity* then the providers of that *regulated activity* must have received authorisation. Having adopted a broad functional approach to activities the persons undertaking those activities must be authorised which adds a more traditional layer of institutional regulation. To gain authorisation a business must satisfy the “fit and proper” person test in the FIT block of the FCA handbook.<sup>580</sup> The FCA tests include detailed requirements relating to a legal person’s honesty, integrity and reputation; competence and

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<sup>578</sup> Financial Services and Markets Act 2000 (Regulated Activities) Order 2001/544 as amended by Financial Services and Markets Act 2000 (Carrying on Regulated Activities by Way of Business) (Amendment) Order 2014/3340; Financial Services and Markets Act 2000 (Regulated Activities) (Green Deal) (Amendment) Order 2014/1850; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) (No. 3) Order 2014/1740; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) (No. 2) Order 2014/1448; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) Order 2014/366; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) (No.2) Order 2013/1881; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) Order 2013/655; Financial Services and Markets Act 2000 (PRA-regulated Activities) Order 2013/556; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) Order 2012/1906; Financial Services and Markets Act 2000 (Carrying on Regulated Activities by Way of Business) (Amendment) Order 2011/2304; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) Order 2011/133; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) Order 2010/86; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) (No. 2) Order 2009/1389; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) Order 2009/1342; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) (No. 2) Order 2007/3510; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) Order 2007/1339; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment No. 3) Order 2006/3384; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) (No.2) Order 2006/2383; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) Order 2006/1969; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) (No.2) Order 2005/1518; Financial Services and Markets Act 2000 (Carrying on Regulated Activities by Way of Business) (Amendment) Order 2005/922; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) Order 2005/593; Financial Services and Markets Act 2000 (Regulated Activities)(Amendment)(No.2) Order 2004/2737; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) Order 2004/1610; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) (No. 3) Order 2003/2822; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) (No. 1) Order 2003/1475; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) (No. 2) Order 2003/1476; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) (No. 2) Order 2002/1776; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) Order 2002/682; Financial Services and Markets Act 2000 (Regulated Activities) (Amendment) Order 2001/3544; Financial Services and Markets Act 2000 (Carrying on Regulated Activities by Way of Business) Order 2001/1177; Financial Services and Markets Act 2000 (Regulated Activities) Order 2001/544.

<sup>579</sup> Paragraph 5 of Financial Services and Markets Act 2000 (Regulated Activities) Order 2001/544.

<sup>580</sup> Available at <<http://fshandbook.info/FS/html/FCA/FIT/1/3>> accessed 11 July 2015.



capability; and financial soundness. The tests apply equally to the controllers of such businesses.<sup>581</sup> If the FCA handbook was extended to governance of crypto-currencies individuals would require to meet the “fit and proper” person test to gain authorisation to be permitted to provide an exchange which effectively controls the funds of customers. Additionally, the providers of exchanges would be required, if authorised, to comply, at all times with the PRIN<sup>582</sup> block of the FCA handbook, the high level principles and obligations applicable to regulated organisations regardless of the products provided.

Furthermore, if the legislation was extended to include the accepting of deposits by the providers of exchange facilities within the remit of *regulated activities* those providers would require to comply with the Conduct of Business [BCOBS]<sup>583</sup> block of the FCA handbook. These establish rules and guidance by which the FCA regulates banking conduct of business in line with the ethical statements of PRIN.<sup>584</sup> Provisions include, ensuring communications are fair, clear and not misleading, ensuring customers are provided with relevant information to make informed decisions and all customers are treated fairly. Whether these obligations are truly novel or merely echo the terms of the Unfair Terms Consumer Contracts Regulations 1999<sup>585</sup> is a moot point however they can be directly enforced in regulatory proceedings by the FCA<sup>586</sup>

The previous analysis of exchanges<sup>587</sup> suggests that certain individuals presently owning or controlling exchanges would be unable to gain authorisation given their previous business dealings<sup>588</sup> and would not satisfy the tests in FIT<sup>589</sup> and SYSC<sup>590</sup> and thus the businesses would be unable to comply with PRIN<sup>591</sup> and BCOBS.<sup>592</sup> This implies these individuals would not be permitted to carry on a *regulated activity* in the UK.<sup>593</sup> Therefore inclusion in the scope of the FCA handbook would require exchanges to apply higher standards to receipt and

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<sup>581</sup> These are set out in the SYSC block of the FCA Handbook available at <<http://fshandbook.info/FS/html/FCA/SYSC>> accessed on 11 July 2015.

<sup>582</sup> Available at <<http://www.fshandbook.info/FS/html/FCA/PRIN>> accessed 11 July 2015.

<sup>583</sup> Available at <<http://fshandbook.info/FS/html/FCA/BCOBS>> accessed 11 July 2015.

<sup>584</sup> The recent fines imposed by the FCA on banks for LIBOR rigging was based on PRIN 3 and 5 as LIBOR was not a regulated market under FMSA: <<http://www.fca.org.uk/static/documents/final-notice/lloyds-bank-of-scotland.pdf>> accessed 11 July 2015 see also FCA Press Release, *Lloyds Banking Group fined £105m for serious LIBOR and other benchmark failings*, 28 July 2014 <<http://www.fca.org.uk/news/lloyds-banking-group-fined-105m-libor-benchmark-failings>> accessed 11 July 2015.

<sup>585</sup> *SI/1994/3159*.

<sup>586</sup> *FSA v Legal and General* <[http://www.fsa.gov.uk/pubs/other/legal\\_general.pdf](http://www.fsa.gov.uk/pubs/other/legal_general.pdf)> accessed 11 July 2015.

<sup>587</sup> See *Chapter 1 (Crypto-currencies)* at 4.1 (*Case Studies*).

<sup>588</sup> For further information, see discussion in *Chapter 1 (Crypto-currencies)* regarding *alleged* hacking and *alleged* insolvency of crypto-currency exchanges of Moolah, MtGox and Mintpal.

<sup>589</sup> FIT Sourcebook available at <<https://fshandbook.info/FS/html/FCA/FIT>> accessed 4 July 2015.

<sup>590</sup> SYSC Sourcebook available at <<https://fshandbook.info/FS/html/FCA/SYSC>> accessed 4 July 2015.

<sup>591</sup> PRIN Sourcebook available at <<https://fshandbook.info/FS/html/FCA/PRIN>> accessed 4 July 2015.

<sup>592</sup> BCOBS Sourcebook available at <<https://fshandbook.info/FS/html/FCA/D136>> accessed 4 July 2015.

<sup>593</sup> It is important to consider the earlier discussions on jurisdiction and assessing the relevant jurisdiction / where activities are undertaken. This clearly presents some issues in the cyber world.



monitoring of the online deposits. Additionally, it should be noted that neither FSMA nor the RAO contain a definition of money – thus consideration and application of the legislation in relation to money falls on the common law legal and economic analysis in *Chapter 2 (Money)*. It was concluded that, in their present form and level of acceptance, crypto-currencies cannot be considered money. This will be key when considering amendments to legislation in *Chapter 6*. While modifications to the RAO and FSMA provide an opportunity to bring crypto-currencies within the scope of deposit regulation, there a number of questions outstanding as to the form such amendments would take and how crypto-currencies can effectively be categorised. These questions and potential regulation will be examined in the recommendations and conclusions in *Chapter 6*.

For completeness, an individual or company accepting deposits at an exchange cannot be considered an exempt person under the legislation and this category is of no relevance to acceptance of crypto-currencies nor consideration as deposits. As such it will not be considered further.<sup>594</sup>

By making the acceptance of funds by exchanges a regulated activity as noted above an authorisation regime follows. As a consequence of authorisation businesses are required to subscribe to the Financial Services Compensation Scheme and to pay annual levies to support the costs of running the appropriate sub-scheme in relation to deposits discussed below at 5.5.2.1. Furthermore businesses must submit themselves to the compulsory jurisdiction of the Financial Ombudsman Service discussed below at 5.5.2.2 and honour their awards. These are minimum requirements. In certain types of business the FCA has chosen to provide further regulation of conduct of the authorised activities by promulgating Sourcebooks of detailed rules which authorised persons must follow. At this stage of development of crypto-currency transactions it is probably too early to provide detailed rules designed to improve business practices. The FCA must have an evidence base on which to make such decisions and at the present level of adoption and use of crypto-currencies there is not yet the appropriate evidence.

### **5.5.2: Deposit Guarantee Schemes**

As evidenced in the preceding paragraphs, the services provided by exchanges fall outwith the remit of regulated activities and therefore exchanges are not required to be authorised as

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<sup>594</sup> An exempt person (in relation to a regulated activity) is a person who is exempt from the general prohibition as a result of: being an appointed representative; the exemption for recognised investment exchanges and clearing houses; or the exemption of EEA market operators exercising a passport right (FSMA 200, s312A (2)).

deposit taking institutions. Nonetheless the protection under the EU Deposit Directive<sup>595</sup> should be considered. The Directive required that member states introduced one or more Deposit Guarantee Schemes<sup>596</sup> to reimburse a limited value of deposits to depositors where a bank fails. The key aim is to strengthen and align protections<sup>597</sup> available to investors across the now 28 member states<sup>598</sup> to provide greater consumer protection and financial stability. One aim is to prevent panic withdrawals, such as was evidenced by the withdrawals from Northern Rock<sup>599</sup> - “the first run on a British Bank in over 140 years.”<sup>600</sup> As previously examined<sup>601</sup> the Government nationalised Northern Rock<sup>602</sup> to protect investors and reassert stability in the industry. Subsequent legislation<sup>603</sup> and a division of the responsibility for monitoring of the financial services industry between the FCA and the PRA was undertaken while enhancing the protections available to investors through the introduction of the three special resolution regimes introduced by the Banking Act 2009. This along with the deposit guarantee scheme was aimed to restore confidence in a newly restabilised banking sector.

#### 5.5.2.1: Financial Services Compensation Scheme<sup>604</sup> (“FSCS”)

The FSCS ensures the UK’s compliance with inter alia the EU Deposit Directive, albeit the powers afforded by FSMA, as amended, extend beyond the scope of the Directive. The FSCS

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<sup>595</sup> EU Deposit Directive 94/19/EC as amended by Directive 2009/14/EC and subsequently replaced by 2014/49/EC which has yet to be transposed into domestic law.

<sup>596</sup> Until 1/12/2001.

<sup>597</sup> While the original 1994 Directive was a minimum harmonisation measure the 2009 amending Directive was a maximum harmonisation measure, as is the 2014 formulation. These latter instruments require transposition exactly unless the terms of the directive provide otherwise.

<sup>598</sup> The original directive provided for €20,000 as a minimum harmonisation measure with the prospect of a self insured amount to a maximum harmonisation measure with a uniform €100,000 across the EU with no self insured amount.

<sup>599</sup> BBC Author, *The rush at Northern Rock continues*, (BBC, London, 15 September 2007)

<<http://news.bbc.co.uk/1/hi/business/6996136.stm>> accessed 24 May 2015; Public Accounts Committee – Eighteenth Report, *HM Treasury: The creation and sale of Northern Rock plc*, 5 November 2012

<<http://www.publications.parliament.uk/pa/cm201213/cmselect/cmpubacc/552/55202.htm>> at “summary” accessed 11 July 2015; Commons Select Committee, *Committee publishes findings on the creation and sale of Northern Rock plc*, 16 November 2012 <<http://www.parliament.uk/business/committees/committees-a-z/commons-select/public-accounts-committee/news/creation-and-sale-of-northern-rock-plc/>> accessed 11 July 2015; Public Accounts Committee – Eighteenth Report, *HM Treasury: The creation and sale of Northern Rock plc*, 5 November 2012

<<http://www.publications.parliament.uk/pa/cm201213/cmselect/cmpubacc/552/55202.htm>> at “conclusions” accessed 11 July 2015.

<sup>600</sup> Roman Tomasic, *Corporate rescue, governance and risk-taking in Northern Rock: Part 1* Comp.Law.2008, 29(10), 297 – 303 at 297.

<sup>601</sup> See *Chapter 1 (crypto-currencies)* at 1.3.3 (*Lack of Central Regulation*).

<sup>602</sup> Bruno Nikolic, *Rise and fall of regulatory state in financial markets*, JIBLR 2013, 28(1), 1 – 8 at 1.

<sup>603</sup> Banking (Special Provisions) Act 2008 which included sunset provisions which were then replaced by the permanent Banking Act 2009 which included the new three special resolutions procedures. Latterly, the Financial Services Act 2012 c21.

<sup>604</sup> As introduced by Part XV (The Financial Services Compensation Scheme) s212 of Financial Services and Markets Act 2000.

amalgamated<sup>605</sup> the previous schemes to provide a single portal for compensation claims for depositors and investors.<sup>606</sup> The scheme aims to provide protection to individual investors, depositors and policyholders who would not generally be in a position to make an informed assessment of the risks to their funds should the firm fail. This protection only extends to consumer and not professional clients.<sup>607</sup> Fisher *et al* explained that as “*the collapse of a financial institution holding substantial sums of investors’ money is an event which can have major repercussions, including, of course, serious hardship for individual investors and a damaging loss of confidence in the financial services industry generally.*”<sup>608</sup> For the purposes of the scheme a deposit is considered “*money placed in a bank or similar [deposit taking] institution to earn interest or for safe-keeping*”<sup>609</sup> and a default is “*where a firm is unable, or likely to be unable to pay claims against it, generally because it has stopped trading, is insolvent or has insufficient assets to meet claims against it.*”<sup>610</sup>

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<sup>605</sup> Previous schemes were divided by field and included, for insurance, the policyholder protection scheme contained in the Policyholders Protection Act 1975; deposit protection by the Banking Act 1979 and for building societies in the Building Societies Act 1986; investor compensation scheme by Financial Services Act 1986. In relation to unsatisfied negligence claims for investment advice the investors compensation scheme offered protection. When residential mortgages and mortgage advice became a regulated activity on 30<sup>th</sup> October 2004 a new sub-scheme was added. This process continued with the regulation of general insurance intermediation and advice on 15<sup>th</sup> January 2005 when the Insurance Mediation Directive was implemented in the UK by amendment of the RAO.

<sup>606</sup> Individuals are protected for deposits up to £85,000 per person per firm (or exchange) for defaults occurring after 31 December 2010. From the end of 2015 this will reduce to £75,000 per person per firm as a result of the appreciation of the Pound Sterling against the Euro where the limit in the Directive is expressed as €100,000 or equivalent in local currency. There were considerable difficulties with institutions which had used their passporting rights to open branches or offer internet banking accounts in the UK at the time of the crisis, particularly the Icelandic banks. Compensation ought to have been paid by the Icelandic compensation scheme as EEA member but it was insolvent. Compensation was in fact paid by UK Government lending money to FSCS and claiming it had lent that money to Iceland to meet its obligations. EFTA Surveillance Authority sued Iceland for failing to ensure payment of the minimum amount of compensation to Icesave depositors in the Netherlands and the UK within the time limits, in (*EFTA Surveillance Authority v Iceland : EFTA court case E16/11*) but the national emergency provision in EEA Agreement was applied by that court to exclude liability. This however is still ongoing *E-8/15 - Financial Services Compensation Scheme Limited v The Depositors' and Investors' Guarantee Fund (TIF)* and is to be heard in EFTA Court on 8 July 2015. This highlights the difficulties in receiving cross border compensation. This undoubtedly has implications for individuals using the services of exchanges following the alleged hacks, as detailed in *Chapter 1 (Crypto-currencies)* and *Chapter 4 (Consumer Protections)*.

<sup>607</sup> As defined in the FCA Handbook as “a *client* that is either a *per se professional client* or an *elective professional client* (see COBS 3.5.1 R) [Note: article 4(1)(12) of *MiFID*] available online at <<http://fshandbook.info/FS/html/FCA/Glossary/P>> accessed 24 May 2015.

<sup>608</sup> Jonathon Fisher *et al*, *The Law of Investor Protection*, 2<sup>nd</sup> Edition (Sweet & Maxwell 2003), at p345.

<sup>609</sup> As detailed on the Financial Services Compensation Scheme website available at <<http://www.fscs.org.uk/>> accessed 11 July 2015.

<sup>610</sup> As detailed on the Financial Services Compensation Scheme website available at <<http://www.fscs.org.uk/>> accessed 11 July 2015.

At present, users of exchanges are offered no protection by FSCS or any other body should an exchange fail.<sup>611</sup> This is inevitable as the loss flows from an area that is not a regulated activity. A user's funds will effectively be at risk of loss should an exchange suffer a default or technological glitches and become unable to repay depositors' deposits.

For the avoidance of doubt, if an individual downloads a wallet application to their computer, tablet or laptop, no third party is storing their crypto-currencies as a deposit and therefore should the individual suffer malfunction, failure or loss of their computer equipment or other inability to access the private key preventing accessing the crypto-currency or the failure of the exchange no compensation will be afforded. Such loss is, and it is recommended should, remain outwith the scope of FSCS.

### 5.5.2.2: Financial Ombudsman Service [FOS]

FOS was established for resolution of disputes by an independent body.<sup>612</sup> Financial institutions are given an opportunity to resolve any complaints within 8 weeks, thereafter if the customer is still not satisfied the complaint can be raised with FOS. This independent body will look to resolve disputes between the customer and financial institution from an independent, neutral perspective.

FOS investigate complaints<sup>613</sup> in accordance with the FCA handbook and industry guidance e.g. FCA thematic reviews and legislation.<sup>614</sup> The statutory scope of FOS has recently been broadened to reflect the introduction of regulation in the areas of e-money, payment

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<sup>611</sup> Mark Oakes, Head of Communications explained that “FSCS protects up to £85,000 of depositors’ money in savings and current accounts with UK authorised bank, building societies and credit unions. However, virtual currencies are not regulated by the UK regulators, so FSCS does not provide protection in the event of any losses suffered by consumers.” <<http://www.fscs.org.uk/industry/news/2014/january/fscs-cautions-consumers-of-virtual-currency/>> accessed 11 July 2015.

<sup>612</sup> As introduced by Part XVI (The Ombudsman Service) s225 of the Financial Services and Markets Act 2000, as amended by Financial Services Act 2012. It replaced eight predecessor bodies, some of which were voluntary such as the Insurance Ombudsman Bureau and other existed to fulfil a statutory require for a consumer redress scheme such as the Banking Ombudsman and the Building Societies Ombudsman. The FOS is the UK node of the FIN-NET network of consumer ADR schemes for financial services disputes established under Commission Recommendation 98/257/EC.

<sup>613</sup> “...its statutory Grundnorm is to resolve disputes by reference to what is fair and reasonable in all circumstances of the case; in doing so it is enjoined to draw on legal rules, regulatory guidance and codes of practice; and of its own volition utilises a subjection notion of maladministration” as quoted in P. Morris *The Financial Ombudsman Service and the Hunt Review: continuing evolution in dispute resolution* 2008 J.B.L. 785 at 787.

<sup>614</sup> In relation to consumers interactions with authorised persons in relation to regulated activity within its compulsory jurisdiction (s228) and in relation to other matters where the authorised person has consented to its voluntary jurisdiction. (s227).

services<sup>615</sup> and consumer credit claims.<sup>616</sup> As noted, neither FSMA<sup>617</sup> nor the RAO contain a generic definition of money so the conclusions drawn in *Chapter 2 (Money)* will be key when considering any extension to the RAO for regulation of crypto-currencies and exchanges.

## 5.6: Electronic Money

Following the conclusions in *Chapter 2*<sup>618</sup> that crypto-currencies cannot, at present be construed as money, this section will examine the potential application of the Electronic Money Directive<sup>619</sup> and Regulations<sup>620</sup> in the governance of crypto-currencies and exchanges.

The EU Deposit Directive<sup>621</sup> states that “*electronic money and funds received in exchange for electronic money should not, in accordance with Directive 2009/110/EC<sup>622</sup> of the European Parliament and of the Council, be treated as a deposit and should not therefore fall within the scope of this Directive.*”<sup>623</sup> An examination of “electronic money” is required to consider if crypto-currencies, albeit not money, fall within the definition of electronic money and the providers of exchanges should be considered “*authorised electronic money institutions.*” If exchange providers could be considered as “*authorised electronic money institutions*” regulation of crypto-currencies and exchanges would fall within the ambit of the Electronic Money Directive rather than governance under the EU Deposit Directive.

The Electronic Money Directive defines electronic money as, “*electronically, including magnetically, stored monetary value as represented by a claim on the issuer which is issued on receipt of funds for the purpose of making payment transactions as defined in point 5 of article 4 of Directive 2007/64/EC,<sup>624</sup> and which is accepted by a natural and legal person other than the electronic money issuer.*” Reference to “*payment transactions*” is therefore required to understand its application – “*payment transaction means an act, initiated by the payer or by the payee, of placing, transferring or withdrawing funds, irrespective of any underlying obligations between the payer and the payee.*” Taken together these directives explain the

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<sup>615</sup> As detailed in *Chapter 3 (Payment)* at 3.7 (*Payment Regulation*).

<sup>616</sup> Further information available at <<http://www.financial-ombudsman.org.uk/publications/ombudsman-news/74/74-ombudsman-focus.htm>> accessed 11 July 2015.

<sup>617</sup> FSMA contains a definition of Electronic Money, as defined in the Electronic Money Regulations 2011.

<sup>618</sup> *Chapter 2 (Money)* at 2.5 (*Conclusions*).

<sup>619</sup> 2009/110/EC.

<sup>620</sup> SI 2011/99.

<sup>621</sup> EU Deposit Directive 94/19/EC as amended by Directive 2009/14/EC as replaced by 2014/49/EC.

<sup>622</sup> Directive 2009/110/EC of the European Parliament and of the Council of 16 September 2009 on the taking up, pursuit and prudential supervision of the business of electronic money institutions amends Directive 2005/60/EC and 2006/48/EC and repealing Directive 2000/46/EC (O) L 267.

<sup>623</sup> EU Deposit Directive 94/19/EC as amended by Directive 2009/14/EC as replaced by 2014/49/EC at (29) available online at <[http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L\\_.2014.173.01.0149.01.ENG](http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2014.173.01.0149.01.ENG)> accessed 11 July 2015.

<sup>624</sup> Payment Services Directive.

definition of electronic money should cover electronic money whether it is held on a payment device, in the electronic money holder's possession or stored remotely at a server and managed by the electronic money holder through a specific account for electronic money. A key criterion is the acceptance other than by the electronic money issuer – thus closed crypto-currencies (identified in *Chapter 1*)<sup>625</sup> would immediately be excluded. The EBA stated that “.....*although some of these criteria are also met by virtual currencies, there is one important difference. In electronic money schemes the link between the electronic money and the traditional money format is preserved and has a legal foundation, as the stored funds are expressed in the same unit of account.*”<sup>626</sup> The EBA concluded that the conversion of a unit of account to a virtual one in a crypto-currency scheme is a fundamental issue. As crypto-currency schemes rely on their own demand and supply mechanisms there is no unit of account to compare the data. Additionally, the EBA state that the demand and supply mechanism invoked by the crypto-currencies means the link and conversion rate to fiat currencies is broken.

Consideration should turn to whether exchanges can be considered *authorised electronic money institutions* and therefore fall under further legislation. The Perimeter Guidance Manual [PERG] of the FCA handbook provides guidance on the definition of “*authorised electronic money institution*,” namely PERG 3A.1 explains the Electronic Money Regulations create an authorisation and registration regime for issuers of electronic money that are not full credit institutions, credit unions or municipal banks. To be an authorised electronic money institution the detailed conditions in Regulation 6 of the Electronic Money Regulations<sup>627</sup> must be met.

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<sup>625</sup> At *Chapter 1 (1.1 The Concept)*.

<sup>626</sup> European Central Bank, *Virtual Currency Schemes* October 2012, <<https://www.ecb.europa.eu/pub/pdf/other/virtualcurrencyschemes201210en.pdf>> accessed 4 July 2015.

<sup>627</sup> 6. Conditions for authorisation

- (1) The Authority may refuse to grant an application for authorisation only if any of the conditions set out in paragraphs (2) to (8) is not met.
- (2) The application must comply with the requirements of, and any requirements imposed under, regulation 5.
- (3) The applicant must immediately before the time of authorisation hold the amount of initial capital required in accordance with Part 1 of Schedule 2
- (4) The applicant must be either—
  - (a) a body corporate constituted under the law of a part of the United Kingdom having—
    - (i) its head office; and
    - (ii) if it has a registered office, that office, in the United Kingdom; or
  - (b) a body corporate which has a branch that is located in the United Kingdom and whose head office is situated in a territory that is outside the EEA.
- (5) The applicant must satisfy the Authority that, taking into account the need to ensure the sound and prudent conduct of the affairs of the institution, it has—
  - (a) robust governance arrangements for its electronic money issuance and payment service business, including a clear organisational structure with well-defined, transparent and consistent lines of responsibility;
  - (b) effective procedures to identify, manage, monitor and report any risks to which it might be exposed; and

PERG 3A.2 (General Issues) confirms that if an organisation issues electronic money in the UK and does not fall within an exclusion or exemption they must be an authorised electronic money institution, a small electronic money institution, or an EEA authorised electronic money institution. The EBA do not consider exchanges to be electronic money institutions. However, in the future if exchanges were considered authorised money institutions if carrying on business in the UK they would require to satisfy various conditions, including being a body corporate with head office in the UK,<sup>628</sup> ensuring compliance with the registration requirements detailed in the Money Laundering Regulations 2007 or its successor and satisfying the tests that the persons responsible for the management of the electronic money and payment services are of good repute and possess appropriate knowledge. This includes the requirement that any persons having a qualifying holding in the payment institution are fit and proper persons. The FIT block of the Handbook and requirements are discussed above. As noted,<sup>629</sup> it appears unlikely the owners and creators of many exchanges would at present be

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(c) adequate internal control mechanisms, including sound administrative, risk management and accounting procedures, which are comprehensive and proportionate to the nature, scale and complexity of electronic money to be issued and payment services to be provided by the institution.

(6) The applicant must satisfy the Authority that—

(a) having regard to the need to ensure the sound and prudent conduct of the affairs of an authorised electronic money institution, any persons having a qualifying holding in the institution are fit and proper persons;

(b) the directors and persons responsible for the management of its electronic money and payment services business are of good repute and possess appropriate knowledge and experience to issue electronic money and provide payment services;

(c) it has a business plan (including for the first three years, a forecast budget calculation) under which appropriate and proportionate systems, resources and procedures will be employed by the institution to operate soundly;

(d) it has taken adequate measures for the purpose of safeguarding electronic money holders' funds in accordance with regulation 20.

(7) The applicant must comply with a requirement of the Money Laundering Regulations 2007 to be included in a register maintained under those Regulations where such a requirement applies to the applicant.

(8) If the applicant has close links with another person ("CL") the applicant must satisfy the Authority—

(a) that those links are not likely to prevent the Authority's effective supervision of the applicant; and

(b) if it appears to the Authority that CL is subject to the laws, regulations or administrative provisions of a territory which is not an EEA state ("the foreign provisions"), that neither the foreign provisions, nor any deficiency in their enforcement, would prevent the Authority's effective supervision of the applicant.

(9) For the purposes of paragraph (8), an applicant has close links with CL if—

(a) CL is a parent undertaking of the applicant;

(b) CL is a subsidiary undertaking of the applicant;

(c) CL is a parent undertaking of a subsidiary undertaking of the applicant;

(d) CL is a subsidiary undertaking of a parent undertaking of the applicant;

(e) CL owns or controls 20% or more of the voting rights or capital of the applicant; or

(f) the applicant owns or controls 20% or more of the voting rights or capital of CL.

<sup>628</sup> Alternatively, there is provision under the Banking Consolidation Directive (2006/48/EC) to establish under a home state regulation and passport in with home state authorisation to establish a branch while complying with the host state regulations. The right to sell is based on home state regulation.

<sup>629</sup> See *Chapter 1 (Crypto-currencies)* at 1.4 (*Case Studies*).



in a position to meet the FIT criteria nor the SYSC.<sup>630</sup> The conviction against the principal of Silk Road has already been examined.<sup>631</sup>

Consideration of the American federal offence of “wire fraud” and Payment Services Directive I and II, when adopted, would be sensible when legislating in relation to crypto-currencies and will be considered further in the following chapter. As previously identified several exchanges are incorporated abroad and significant structural amendments would be required to fall into the scope of the Electronic Money Regulations.

## 5.7: Collective Investment

While crypto-currencies are not deposits for the reasons discussed, this is only one category of regulated activity within FSMA and the RAO. Crypto-currencies do not naturally fit into other categories of investment. It appears providers of exchanges are not offering nor promoting storage in hosted wallets as an investment vehicle – even if, as the previous analysis concluded this is the intention of many individuals.<sup>632</sup> Nonetheless the provisions of FSMA regarding Collective Investment Schemes are of potential application. Operating a Collective Investment Scheme is a regulated activity.<sup>633</sup> Any arrangements with respect to property of *any* description, including money, the purpose or effect of which is to enable persons taking part in the arrangements (whether by becoming owners of the property or any part of it or otherwise) to participate in or receive profits or income arising from the acquisition, holding, management or disposal of the property or sums paid out of such profits or income falls within the scope of the regulation of collective investment scheme. This section has the ability to capture crypto-currency operations regardless of whether crypto-currencies are defined as money or commodities or investment or some other category of property.

Persons who participate in Collective Investment Schemes must not have day-to-day control over the management of the property, whether or not they have the right to be consulted or to give directions as to investment, in addition to the pooled nature of the contributions.<sup>634</sup> The characteristics of funds held in “hosted wallets” with exchanges allows individuals to automatically access and control the fund flow in their respective “online wallets.” It is plain that the providers of exchanges are not providing the opportunities associated with Collective Investment Schemes and storage in “hosted wallets” could not be considered as Collective

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<sup>630</sup> Senior Management Arrangements, Systems and Controls.

<sup>631</sup> In *Chapter 1 (Crypto-currencies) at 1.4 (Case Studies)*.

<sup>632</sup> Further information is detailed in *Chapter 1 (Crypto-currencies)*.

<sup>633</sup> FSMA s235

<sup>634</sup> FSMA s235(2)



Investment vehicles.<sup>635</sup> Thus, no further analysis of Collective Investment Schemes is required.

## 5.8: Conclusions

As demonstrated by the above analysis, at present crypto-currencies and exchanges fall outwith the regulatory landscape. Opportunities to develop and expand the regulatory framework for the inclusion of crypto-currencies and the services provided by exchanges is plausible. This chapter has touched upon some amendments, but the following chapter will examine these possible extensions alongside bespoke regulation to provide a functional approach to regulation of crypto-currencies.

Concerns are abundant regarding the lack of standards required by exchanges to ensure market stability and fairness. In addition, there has already been evidence of widespread consumer detriment owing to the losses flowing from alleged hacks and losses by the exchanges. Consumers have limited recourse against exchanges for such losses and owing to the lack of current regulation fall outwith the protections of FOS and FSCS. Owing to the constant evolution of the market and the improving technology there is a risk that detailed legislation will soon become outdated and could stifle innovation. Therefore introduction of principle based regulation at a tertiary level, in a similar vein to the regulation for platform service providers, would be appropriate to combat the lack of guidance. This will be discussed further in the next chapter.

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<sup>635</sup> An interesting case regarding collective investment vehicles is: *Financial Conduct Authority v Capital Alternatives Ltd and others* [2014] EWHC 144 (Ch). Capital Alternatives were promoters and operators of four land investment schemes which bought subleases with investors capital on the basis the investors would receive a share of the profit. The FCA brought a claim for declaration that the schemes were collective investment schemes under s235 of FSMA 2000. Capital Alternatives argued that the terms of the investment scheme provided that the property within the scheme consisted of individual pots so individual investors were provided individual returns and this was not a collective investment scheme. The court held that the management of the properties was “on a whole” and accordingly the schemes were collective investment schemes. A further case considering a collective investment scheme is: *Andrew Brown and others v InnovatorOne Plc and others* [2012] EWHC 1321.

## Chapter 6: Recommendations and Conclusions

### 6.1: The story so far

The nature of crypto-currencies has been examined in Chapters 2 (Money) and 3 (Payment).

Whether analysed from a legal or economic stance it is clear that, at present, crypto-currencies cannot be regarded as money<sup>636</sup> primarily owing to the lack of universal acceptance<sup>637</sup> and ongoing volatility in value.<sup>638</sup> As explored above, the most widely accepted and debated crypto-currency is bitcoin. The number of daily transactions, as recorded in the Blockchain, is a measure of the breadth of its acceptance. As noted in *Chapter 1 (Crypto-currencies)*<sup>639</sup> the rolling seven day average is around 100,000 transactions worldwide. This demonstrates a continuing level of acceptance amongst the crypto-currency community at a level considerably greater than other crypto-currencies, but these figures confirm the level of acceptance is not, at present, universal.

Regardless of acceptance issues, crypto-currencies exhibit some of the characteristics of money and the European Banking Authority [EBA] recently acknowledged that crypto-currencies “....could potentially fulfil one or more of the functions of money.”<sup>640</sup> If this novel product continues to become more widely accepted with usage expanding beyond the limited network then crypto-currencies may come to fulfil the definitional elements of money.

Intrinsically linked with money is payment. As explored above<sup>641</sup> the value of bitcoin since inception has been extremely volatile and confirms that contracting for payment by bitcoin, or another crypto-currency, is a play as to its future value – not dissimilar to commodity transactions. At present, crypto-currencies cannot be regarded as a means of payment, unless, under the terms of a contract the creditor has agreed to accept payment by crypto-currency. Owing to this volatility in value, contractual payment by crypto-currency is regarded as an investment play and likely to be regarded as commodity-exchange rather than fulfilment of a payment obligation by fiat currency.<sup>642</sup> The proposition that payment by crypto-currency constitutes commodity trading was furthered by the founder of litecoin when he recently

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<sup>636</sup> *Chapter 2 (Money)* at 2.5 (*Conclusions*).

<sup>637</sup> *Chapter 2 (Money)* at 2.3.1 (*Medium of Exchange*) and 2.4.4 (*Medium of Exchange*).

<sup>638</sup> *Chapter 2 (Money)* at 2.3.3 (*Store of Value*) and 2.4.5 (*Store of Value*).

<sup>639</sup> At *Chapter 1 (Crypto-currencies)* 1.4 (*Case Studies*).

<sup>640</sup> European Banking Authority, *Opinion on “Virtual Currencies”* (2014) <<http://www.eba.europa.eu/documents/10180/657547/EBA-Op-2014-08+Opinion+on+Virtual+Currencies.pdf>> at p12, accessed 11 July 2015.

<sup>641</sup> At *Chapter 1 (Crypto-currencies)* 1.4 (*Case Studies*).

<sup>642</sup> See Kokott AG opinion discussed at 3.1 (*Requirements*).

confirmed that crypto-currencies can be traded speculatively,<sup>643</sup> not only with direct trading but also through derivative contracts.<sup>644</sup> This analysis confirms the definitional uncertainty and thereby the requirement for regulatory guidance for this advancing product.

Rival crypto-currencies have recently suffered a similar fate. The values exchanged under altcoin transactions remain low. Jackson Palmer, the founder of dogecoin has left<sup>645</sup> leaving the venture without focus. Development of litecoin has similarly been given a low priority by its founder.<sup>646</sup>

The exploration in the foregoing chapters confirms that crypto-currency networks are not collective investment schemes.<sup>647</sup> While certain activities in the crypto-currency infrastructure may be organised as collective investment schemes, an example is the emergence of mining pools<sup>648</sup> with central management, pooled resources to crack the algorithms and division of the rewards, the crypto-currency network and purchase of crypto-currencies does not constitute a collective investment scheme. Further consideration of the regulation surrounding collective investment schemes alongside the economics and mechanics of mining pools is however outwith the scope of this thesis.

### 6.1.1: Definitional Regulation

Chapter 5 (Regulation) confirms that if conventional regulatory definitions of money and payment are applied, crypto-currencies fall outwith the regulated perimeter. Two further features are obvious from the literature. Firstly, where an exchange holding crypto-currencies to the account of their customers<sup>649</sup> fails for any reason then the consumers with funds held are not entitled to repayment and invariably will suffer detriment.<sup>650</sup> As crypto-currencies fall outwith the regulated sphere there are no protections for consumers should exchanges suffer losses. Secondly, the crypto-currency network has and continues to be used for nefarious purposes. To reduce the risk of exchanges being used as conduits for illegality they should come under the Customer Due Diligence [CDD] requirements of the Anti-Money Laundering [AML] regime<sup>651</sup> – there are examples of the application of CCD to casinos, dealers in high

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<sup>643</sup> Daniel Cawrey, *Video: Charlie Lee on Scams, Plans and Being "Satoshi Lite"* (Coindesk, USA, 11 February 2015) <<http://www.coindesk.com/video-charlie-lee-scams-plans-satoshi-lite/>> accessed 11 July 2015.

<sup>644</sup> Consideration in *Chapter 5 (Regulation)* at 5.4.3 (*Market Abuse Directive*).

<sup>645</sup> Pete Rizzo, *Dogecoin Founder Exits Crypto Community Citing "Toxic" Culture*, (Coindesk, USA, 24 April 2015) <<http://www.coindesk.com/dogecoin-founder-bitcoin-toxic/>> accessed 11 July 2015.

<sup>646</sup> Daniel Cawrey, *Video: Charlie Lee on Scams, Plans and Being "Satoshi Lite"* (Coindesk, USA, 11 February 2015) <<http://www.coindesk.com/video-charlie-lee-scams-plans-satoshi-lite/>> accessed 11 July 2015.

<sup>647</sup> *Chapter 5 (Regulation)* at 5.7 (*Collective Investment*).

<sup>648</sup> *Chapter 1 (Crypto-currencies)* at 1.2 (*Operation*).

<sup>649</sup> In online hosted wallets.

<sup>650</sup> *Chapter 1 (Crypto-currencies)* at 1.4 (*Case Studies*).

<sup>651</sup> *Chapter 5 (Regulation)* at 5.4.1 (*Money Laundering*).

value items and money transmission services without the necessity of their being subject to the full regulatory regime. Application of minimum AML requirements would legitimise use of crypto-currencies and will be considered further below.

The potential for consumer detriment through losses in the novel area of crypto-currencies, where concepts may not be familiar to consumers (or regulators), provides a case for imposing a regulatory regime upon exchanges. The relevant regulation is a matter for judgement on the part of regulators and has thus far produced differing approaches reflecting risk appetite and the level of adoption of crypto-currencies in the relevant countries. Previous regulatory failures to identify new markets and products in financial services<sup>652</sup> provide an impetus for prompt intervention to proactively support development of crypto-currencies and the UK financial market. Yet regulation must not stifle innovation or the growth of crypto-currencies and exchanges. Taking this balance into account, governments and regulators have commenced assessing whether, and how, crypto-currencies and the crypto-currency network should be regulated.<sup>653</sup> For example, Australian tax authorities recently determined that bitcoin and crypto-currency transactions are subject to taxation for goods rather than money.<sup>654</sup> Australian regulators however concluded that there was insufficient adoption of crypto-currencies to justify regulatory intervention.<sup>655</sup> This non-interventionist approach can be contrasted with the introduction in the Isle of Man of legislation to provide a governing framework for the anticipated “take off”<sup>656</sup> of crypto-currencies.<sup>657</sup> In the UK in August 2014, the Chancellor of the Exchequer<sup>658</sup> launched plans to make the UK a global centre of financial innovation. One aspect of the plan was pro-innovation regulatory measures to unlock the potential of new technology. This was reflected by the launch of a Government consultation on the potential of digital currencies and associated technologies in November 2014.<sup>659</sup> Over 120 responses<sup>660</sup>

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<sup>652</sup> For example, failures to regulate LIBOR and FX trading markets as discussed in *Chapter 5 (Regulation)* at 5.2.2: *Safety and Soundness*.

<sup>653</sup> Payments Council and British Bankers Association, Response to HM Treasury Call for Information, 3 December 2014 at p2

<sup>654</sup> The Australian Tax Office explained that “*bitcoin is not a legally recognised universal means of exchange and form of payment by the laws of Australia or the laws of any other country. Therefore, it is not ‘currency (whether of Australia or of any other country)’*” as quoted in Alex Hern, *Bitcoin hit with tax blow in Australia*, (The Guardian, London, 19 December 2014) < <http://www.theguardian.com/technology/2014/dec/19/bitcoin-hit-tax-blow-australia> > accessed 11 July 2015.

<sup>655</sup> See opinion of Kokott AG discussed at 3.1 (*Requirements*).

<sup>656</sup> Zoe Kelinman, *Bitcoin Island: cleaning up the crypto-currency*, (BBC, London, 24 April 2015) < <http://www.bbc.co.uk/news/business-32394170> > accessed 11 July 2015.

<sup>657</sup> As further discussed below.

<sup>658</sup> At the time George Osborne.

<sup>659</sup> HM Treasury, *Digital Currencies: Call for Information* < <https://www.gov.uk/government/consultations/digital-currencies-call-for-information> > accessed 11 July 2015.

<sup>660</sup> HM Treasury, *Digital Currencies: Response to the Call for Information* < <https://www.gov.uk/government/consultations/digital-currencies-call-for-information> > accessed 11 July 2015.

were received and are summarised in the Government's response, published in March 2015.<sup>661</sup> This chapter will continue to build on the foregoing analysis and identify potential domestic regulation to legitimise use, exchange and deposit of crypto-currencies and touch points with regulation focusing on the key themes of consumer protection and commodity regulation.

### 6.1.2: Approach

If it is decided to apply regulation then two broad approaches might be adopted (a) adapt existing definitions – which may have unforeseen consequences in relation to business models of existing providers or (b) provide a sui generis regime of bespoke regulation. This chapter will now consider both approaches and provide recommendations to sustain development of the Blockchain technology, not into a disruptive force, but a vital component in the furtherance of the UK as a financial hub.<sup>662</sup>

This thesis has provided an analysis of the development of crypto-currencies and the surrounding infrastructure. It has not been the intention to provide a complete technological analysis but it is hoped this work will be a stimulus for further discussion and debate on the practicalities and adoption of crypto-currencies. The identification of potential regulation will form a basis for further works to explore the practical implementation of the recommendations to secure adequate protection for consumers. This need not involve all of the elements discussed below which offer a menu approach from which the most appropriate tools could be selected. Some of these tools however may be dependant on the adoption of certain others.

### 6.2: Money Laundering

As discussed<sup>663</sup> illegality and laundering of criminal funds have become synonymous with the use and exchange of crypto-currencies. This connection undermines key policy objectives for regulation of the financial sector<sup>664</sup> - ensuring financial institutions do not participate wittingly or otherwise in organised crime which affects the safety and soundness of the financial

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<sup>661</sup> HM Treasury, *Digital Currencies: Response to the Call for Information* <<https://www.gov.uk/government/consultations/digital-currencies-call-for-information>> accessed 11 July 2015.

<sup>662</sup> James Quinn, *George Osborne embraces Bitcoin as London aims to be centre of global financial technology revolution*, (The Telegraph, London, 6 August 2014) <<http://www.telegraph.co.uk/finance/currency/11014508/George-Osborne-embraces-Bitcoin-as-London-aims-to-be-centre-of-global-financial-technology-revolution.html>> accessed 11 July 2015.

<sup>663</sup> *Chapter 1 (Crypto-Currencies) at 1.4 (Case Studies)*.

<sup>664</sup> To achieve visible and effective investor protection regulation, FSMA adopted a functional approach in relation to its key statutory objectives of: (i) consumer protection; (ii) integrity of UK financial institutions and markets while securing effective competition in the interests of consumers. Financial Services and Markets Act 2000 c8 at section 1B(3).

sector.<sup>665</sup> The Government wishes to support the development of legitimate businesses and thereby create a hostile environment for illegal digital currency businesses.<sup>666</sup> This might be compared with early digital music piracy where disruptive players who operated illegally were removed from the market.<sup>667</sup> Existing technology companies developed internet based music sharing legitimately in accordance with regulation. This altered business base by Apple iTunes<sup>668</sup> and Spotify<sup>669</sup> has resulted in a change in the way music is purchased and they have become key market players. A similar opportunity therefore exists to regulate crypto-currency use and dissuade illegal entities from entering, or continuing, in the market through adequate regulation and sanctions.<sup>670</sup> One such avenue is through the introduction of mandatory anti-money laundering requirements by exchanges - an approach recommended by many respondents to the Government's Call for Information,<sup>671</sup> including the United Kingdom Digital Currency Association [UKDCA].

Appropriate money laundering regulation is a near term goal to legitimise use which will remove players who are prepared to allow themselves to be associated with illegality.<sup>672</sup> This may improve consumer confidence leading to wider adoption and as noted, dissuade illegal entities from being involved. A corollary of minimum Customer Due Diligence [CDD] is that the anonymity of users of crypto-currencies - one of the attractive features of the network to users - will be further compromised. The introduction of CDD and AML requirements have the opportunity to elevate crypto-currencies in public opinion and ensure adequate levels of security are adopted. The UK Government's analysis of the responses to the call for

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<sup>665</sup> The BCCI Banking scandal is of particular importance. BCCI went bust owing more than £10bn to its creditors after having operated a complex internal system shifting assets from company to company to increase borrowing limits. The Bank of England were subject to claims by depositors after failing to take action against BCCI, which it knew was badly run. Further information is available in Sam Jaffa, *Great Financial Scandals: The schemers and scams behind the greatest financial disasters* (Robson Books Ltd, London, 1998) p235 – 263.

<sup>666</sup> HM Treasury, *Digital currencies: response to the call for information*, March 2015 at 1.4 <[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/414040/digital\\_currencies\\_response\\_to\\_call\\_for\\_information\\_final\\_changes.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/414040/digital_currencies_response_to_call_for_information_final_changes.pdf)> accessed 11 July 2015.

<sup>667</sup> For example Napster which enabled users to share music files on their hard drives over a common free server. This had no regard for copyright laws and was ordered to close following legal action in San Francisco. Further information is BBC Author, *Napster shut down*, (BBC, London, 27 July 2000) <<http://news.bbc.co.uk/1/hi/entertainment/852283.stm>> accessed 11 July 2015. A further example was Limewire which operated a similar business model with a shared public platform for accessing other users hard drives.

<sup>668</sup> iTunes information available at <<https://www.apple.com/uk/itunes/>> accessed 11 July 2015.

<sup>669</sup> Spotify information available at <<https://www.spotify.com/uk/>> accessed 11 July 2015.

<sup>670</sup> This can be contrasted with the recent regulation in relation to Payday Loans as explored at *Chapter 1 (Crypto-currencies)* at 1.3.4 (*Prohibition*).

<sup>671</sup> United Kingdom Digital Currency Association, *The UK Digital Currency Association's response to HM Treasury's Digital Currencies: Call for Information*, 3 December 2014.

<sup>672</sup> *Chapter 1 (Crypto-currencies)* at 1.4 (*Case Studies*).

information confirms the intention to apply anti-money laundering regulation to digital currency exchanges in the UK to support continuing development of crypto-currencies and prevent criminal use.<sup>673</sup> An immediate opportunity is the extension of the reach and scope of the Money Laundering Regulations to exchanges by statutory instrument after consultation.<sup>674</sup> Extension would introduce CDD checks to confirm the customer's identity and obtain, in advance, information as to the purpose and extent of the business relationship. This would be subject to ongoing industry guidance and sector specific recommendations for implementation. Checks would require to be undertaken upon the establishment of a business relationship i.e. when a consumer opens an online wallet with an exchange and would immediately offer legitimacy to transactions. Amendment by this route will require to give consideration when transposing the Fourth Money Laundering Directive. The legislative base of the Fourth Money Laundering Directive is Article 114 TFEU – the approximation of law of member states to facilitate the establishment and functioning of the EU. Therefore mutual cooperation with the Fourth Money Laundering Directive is required rather than maximum harmonisation. This permits the UK to choose to over-implement and thereby introduce money laundering requirements for exchanges – a matter on which the Fourth Money Laundering Directive is silent - in transposing the Fourth Money Laundering Directive. The anti-money laundering provisions currently in place for high value dealers and casinos, already covered by the Third Money Laundering Directive, offers an immediate model for the extension to exchanges. The oversight would be undertaken by HMRC in this model. This would not require the extension of the regulated perimeter nor oversight by FCA and is the least intrusive form of control of exchanges which may be considered consistent with the creation of a supportive environment for financial innovation.

Alternatively, the Isle of Man offer a model under its Proceeds of Crime regulation. The Isle of Man Government has amended the Proceeds of Crime Act 2008<sup>675</sup> to extend application to bitcoin companies, including exchanges, operating from the Isle of Man. The Proceeds of Crime Act now extends to *“the business of issuing, transmitting, transferring, providing safe custody or storage of, administering, managing, ending, buying, selling, exchanging or otherwise trading or intermediating convertible virtual currencies, including crypto-currencies*

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<sup>673</sup> <[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/414040/digital\\_currency\\_response\\_to\\_call\\_for\\_information\\_final\\_changes.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/414040/digital_currency_response_to_call_for_information_final_changes.pdf)> at section 1.5.

<sup>674</sup> Conversely the Italian Central Bank recently determined that exchanges are not required to enforce anti-money laundering policies as crypto-currencies are not currency. Further information available at Joon Ian Woong, *Italian Central Bank: No AML Requirement for Bitcoin Exchanges*, (Coindesk, USA, 5 February 2015) <<http://www.coindesk.com/italian-central-bank-no-aml-requirement-bitcoin-exchanges/>> accessed 11 July 2015.

<sup>675</sup> Proceeds of Crime (Business in the Regulated Sector) Order 2015 SI 2015/0073.



*or similar concepts where the concept is accepted by persons as a means of payment for goods or services, a unit of account, a store of value or a commodity.*" This forms an alternative model for the UK to adopt but the definition of criminal property in the UK POCA is already broad enough to encompass crypto-currencies. However the reporting and tipping off offences in POCA would require exchanges to be brought formally within the regulated sector. The Isle of Man also intend to amend the Designated Businesses (Registration and Oversight) Bill 2014<sup>676</sup> to extend the scope of the Isle of Man Financial Services Commission [FSC] to oversee and regulate crypto-currency and exchange businesses operating from the Isle of Man. This extension attempts to disassociate crypto-currencies and illegality and provide a legitimate base from the Isle of Man. Critics have questioned the associated costs of establishing businesses in the Isle of Man<sup>677</sup> inferring establishment in less stringent jurisdictions would be preferable. This is a form of regulatory arbitrage whereby there is a race to the bottom i.e. a race to the country with the least regulations and restrictions for exchange providers. The provisions have only recently been approved, thus the effects on the crypto-currency industry operating from the Isle of Man cannot yet be quantified. However, once these amendments have been implemented and the impact assessed, the UK Government could consider replicating the amendments through domestic statutory instruments to extend the scope of POCA and FCA regulation.

### 6.3: Commodities and regulated markets

The Market Abuse regime in s118 and s118A FSMA, as amended, might be extended, notwithstanding the new UK Market Abuse Regime Regulation<sup>678</sup> and the Market Abuse Regulation and Market Abuse Directive 2 [MAD2],<sup>679</sup> to exchanges converting fiat currencies to crypto-currencies and vice versa. As part of the EU Financial Services Action Plan,<sup>680</sup> the Market Abuse Regulation provides for the civil and regulatory regime to be uniform throughout the EU. This can be differentiated from Market Abuse Directive 1 [MAD1] because of the differing base implementation. The UK had, prior to the promulgation of MAD1 included

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<sup>676</sup> The Designated Business (Registration and Oversight) Bill 2014 received its third reading in the House of Keys on 3 February 2015, the lower house of Tynwald, its Parliament.

<sup>677</sup> Emily Spaven, *Isle of Man Introduces Regulation for Bitcoin Businesses*, (Coindesk, USA, 26 March 2015) <<http://www.coindesk.com/isle-of-man-introduces-regulation-for-bitcoin-businesses/>> accessed 11 July 2015.

<sup>678</sup> The Financial Services and Markets Act 2000 (Market Abuse) Regulations 2014/3081.

<sup>679</sup> Regulation 596/2014 due to take effect on 3 July 2016.

<sup>680</sup> The Financial Action Plan was introduced as part of the Lamfalussy process. Further information on the Financial Action Plan is available at <[http://ec.europa.eu/finance/general-policy/actionplan/index\\_en.htm#maincontentSec1](http://ec.europa.eu/finance/general-policy/actionplan/index_en.htm#maincontentSec1)> accessed 4 July 2015 and information regarding the so-called Lamfalussy Directives is available at <[http://ec.europa.eu/finance/securities/lamfalussy/transposition/index\\_en.htm](http://ec.europa.eu/finance/securities/lamfalussy/transposition/index_en.htm)> accessed 11 July 2015.



certain commodity markets within the scope of the provisions.<sup>681</sup> Those super equivalent provisions were retained when s118 was amended to transpose MAD1.<sup>682</sup> The UK model is therefore more expansive than the European requirements on Market Abuse.

As noted, certain US authorities have treated bitcoins as commodities for regulatory purposes, particularly in relation to derivative contracts based on bitcoins.<sup>683</sup> There is therefore experience of other regulators seeking to apply commodities' regulation to crypto-currencies. This would prevent potential market manipulation in attracting consumers by offers of guaranteed conversion rates to and from crypto-currencies. Regulation under the commodity umbrella would also protect consumers from abusive practices such as pre-positioning when consumers place orders and the exchanges buys or sells ahead of that order to its advantage.<sup>684</sup>

Crypto-currencies exhibit characteristics of each of money, payment services and commodities but satisfy the current definitions of none. This is a complex area and will require careful definitional guidance by the Government – should crypto-currencies be considered money and regulation accordingly amended or should regulation of crypto-currencies be on similar terms to commodity markets such as the London Metal Exchange? The holding of a euro or dollar denominated account is not uncommon in the UK. Exchange rates between sterling to euro and sterling to dollar fluctuate. Derivative contracts, options, futures and contracts for differences exist in relation to these exchange rate risks. There is no suggestion that dollar or euro are commodities in the UK. The derivative contracts of options, futures and contracts for differences in relation to any currency are already regulated.<sup>685</sup> If crypto-currencies are treated as a currency as they satisfy a revised definition of money then these derivative contracts of options, futures and contracts for differences would also be regulated. This would provide an avenue to bring crypto-currencies within regulation without the need to apply commodity regulation to the use of crypto-currencies.

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<sup>681</sup> *Chapter 5 (Regulation) at 5.4.3 (Market Abuse).*

<sup>682</sup> To ensure the continued need for retention of the broader provisions in section 118 FSMA, the sections were to be kept under review. The Government therefore made these provisions subject to a sunset clause where they would expire after a period of 3 years unless the regulation was amended to keep them in. The Government has since extended this 4 times. Further information is detailed in Explanatory Memorandum to the Financial Services and Markets Act 2000 (Market Abuse) Regulations 2014 < [http://www.legislation.gov.uk/ukxi/2014/3081/pdfs/ukxiem\\_20143081\\_en.pdf](http://www.legislation.gov.uk/ukxi/2014/3081/pdfs/ukxiem_20143081_en.pdf) > accessed 5 July 2015.

<sup>683</sup> *Chapter 5 (Regulation) at 5.4.3 (Market Abuse).*

<sup>684</sup> MAR1 the code of market conduct particularly 1.6 .15 and 1.7.

<sup>685</sup> Financial Services and Markets Act 2000 (Regulated Activities) Order 2001/544 at section 83, 84 and 85.

It is therefore submitted that regulators resist the temptation to simply regard crypto-currencies as commodities and consider a hybrid approach to regulation. This would adopt a suitable mechanism of protection for consumers.

## 6.4: Consumer detriment

### 6.4.1: Extension of RAO / FIT Sourcebook

The foregoing chapters highlight extensive consumer detriment in the use and exchange of crypto-currencies through a lack of information asymmetry as to the financial security of the exchange itself.<sup>686</sup> There have been a number of recent examples of exchanges closing because they are unprofitable or because their business model becomes unsustainable. Furthermore the number of alleged hacks on exchanges, at least some of which are almost certainly cases of embezzlement of funds, have resulted in consumers losing the bitcoins lodged and the value which they represent. This provides another justification for regulatory intervention. An immediate response is to extend the definitions of deposit or investment in the Financial Services and Markets Act 2000 (Regulated Activities) Order, as amended (“RAO”). Exclusion of crypto-currencies from money<sup>687</sup> currently prohibits protection under the RAO. The exact terms of such extension will require considered analysis to determine the appropriate level of extension required and be balanced with the above recommendations regarding regulation of crypto-currencies as a hybrid. The principal stumbling block to that is of course the failure of crypto-currencies to qualify as money.<sup>688</sup> However if they were to be defined as investment of a type such as one conforming to the MiFID Directive criteria then the client money rules contained in the PRIN block of the FCA Handbook and amplified in the CASS block would apply.<sup>689</sup> This requires the complete segregation of clients’ monies<sup>690</sup> and would require an exchange to retain the full value of funds deposited in crypto-currency to the account of the respective depositors.<sup>691</sup> This offers a completely different and much more onerous business model from deposit taking for exchanges. That might the type of regulatory intervention that would effectively prohibit the industry operating.<sup>692</sup>

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<sup>686</sup> Chapter 1 (Crypto-currencies) at 1.4 (Case Studies).

<sup>687</sup> Chapter 2 (Money) at 2.5 (Conclusions).

<sup>688</sup> Chapter 2 (Money) at 2.5 (Conclusions).

<sup>689</sup> CASS 7.10 available at <<https://fshandbook.info/FS/html/FCA/CASS/7/10>> accessed 11 July15.

<sup>690</sup> CASS 7.13.

<sup>691</sup> *Lehman Bros v CRC Credit Fund Ltd* [2012] UKSC 6.

<sup>692</sup> See section 1.3.4 (Prohibition) and the discussion of the regulation of payday lenders.

Extension of the RAO to incorporate crypto-currencies would bring exchanges into the scheme of FSMA, including the FCA Handbook. Options for extension include by amending the definition of deposit or creating a new category of crypto-currency transactions within the RAO. The new category would provide some sui generis regulation which does not conflict with existing categories in the RAO given that crypto-currencies exhibit categories of both money and commodities. This avenue provides an opportunity to provide bespoke guidance within the requirements to amend any existing definitions within the RAO. This approach would provide a nurturing approach for the further development of crypto-currencies thereby aligning with the Government's aim of establishing the UK as a financial hub for developing technologies.

Extension of the RAO would result in the FIT sourcebook of the FCA Handbook being applicable to those exercising controlling functions at exchanges – and potentially crypto-currencies depending on ascertainment of the characteristics of the crypto-currency in question. This could potentially remove incidences such as the embezzlement at Mt Gox.<sup>693</sup> Thus suggesting that fitness to own and manage the business, as well as the maintenance of sufficient capital and the capacity to monitor operations were not apparent. The requirement to comply with the FIT principles seeks to ensure individuals are honest and trustworthy prior to establishment of an exchange. This could be retrospectively applied to founders of existing exchanges. Exchanges would also be required to comply with the PRIN block of the FCA sourcebook. These high level principles impose standards on the exchanges and would elevate the level of consumer protection available. The success of the implementation of the FCA Handbook may indicate that an extension of the authorised regime under FSMA might be appropriate in the future.

#### **6.4.2: CRYPT Sourcebook**

Extension of existing sourcebooks provide immediate protection to consumer. However, this is not considered sufficient. An additional route of protection is proposed by way of a new conduct of business sourcebook – CRYPT – as a specialist sourcebook. This bespoke

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<sup>693</sup> Recent press coverage suggests that the loss on the MtGox platform was due to internal system manipulation and not any external attack. The articles also suggest that MtGox manipulated the value of bitcoins purchasing through accounts when the value was low then disappearing. For further information, Jon Southurst, *Missing Mt Gox Bitcoins Likely an Inside Job, Say Japanese Police*, (Coindesk, USA, 1 January 2015) <<http://www.coindesk.com/missing-mt-gox-bitcoins-inside-job-japanese-police/>> accessed 11 July 2015 and Yessi Bello Perez, *Report: Mt Gox Data Provides More Clues to Trading Bot "Willy"* (Coindesk, USA, 19 February 2015) <<http://www.coindesk.com/report-mt-gox-data-provides-more-clues-to-trading-bot-willy/>> accessed 11 July 2015.

sourcebook would regulate crypto-currencies and exchanges as specialised business sectors. Similar to the Collective Investment Schemes [COLL] Sourcebook<sup>694</sup> this could specify investor relations, money laundering requirements, qualification as an exchange and operating duties and responsibilities. The FCA sourcebooks permit regular updating as technology and use develops. Such tertiary rules and guidance provide an immediate and flexible approach rather than through prescriptive regulation and a succession of statutory instruments. This avenue also provides an opportunity to engage exchanges and consumers to understand the problems regularly encountered and the protections suitable for rectification.

### 6.4.3: Certification Marks

Finally, the UKDCA recommend that a set of standards are developed (via a Certification Mark) to encourage participants to operate and innovate industry-defined best practices. Such certification marks would be similar to ISO marks<sup>695</sup> to reassure the public about the quality of the services. Use of certification marks would ensure there is a consistent standard in the crypto-currencies and exchanges providing services<sup>696</sup> and provide alignment rather than each exchange operating on an OTC basis. The Government confirmed in its response to the Call for Information that it will work with British Standards Institution and the digital currency industry to develop standard certification marks to ensure levels of consumer protection.<sup>697</sup>

An entire infrastructure will require to be developed to secure implementation and differentiation of those services achieving the Certification Mark from those falling short of the required standards.<sup>698</sup> This suggestion has gravitas in offering a standard to consumers, however implementation is no “quick fix” and this would require large scale adoption by exchanges to be effective. This recommendation will therefore require considerable buy-in from crypto-currency stakeholders before effectiveness can be ascertained. At present it is unclear if crypto-currency stakeholders would be prepared to undertake additional work and incur the associated costs. Given the number of problems encountered in this young industry it is difficult to believe that it has the capacity to behave ethically and adopt quality standards. Additionally the Certification Mark would require to be compulsory to elevate above the voluntary BSI kite mark. This has been further demonstrated by the comments following

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<sup>694</sup> Available at <<https://fshandbook.info/FS/html/FCA/COLL>> accessed 11 July 2015.

<sup>695</sup> International Organisation for Standardisation (ISO) is an independent, non-governmental membership organisation and the world’s largest developer of voluntary international standards. Further information available at <<http://www.iso.org/iso/home/about.htm>> accessed 11 July 2015.

<sup>696</sup> United Kingdom Digital Currency Association, *The UK Digital Currency Association’s response to HM Treasury’s Digital Currencies: Call for Information*, 3 December 2014

<sup>697</sup> At 1.7

<sup>698</sup> United Kingdom Digital Currency Association, *The UK Digital Currency Association’s response to HM Treasury’s Digital Currencies: Call for Information*, 3 December 2014

announcement by the Isle of Man Government of extension of regulation to crypto-currency exchanges.<sup>699</sup> The UK Government previously attempted to introduce CAT<sup>700</sup> standards for ISAs. These voluntary marks were not an endorsement of the product and proved unpopular with providers and customers. Ultimately the Government removed CAT standards in favour of stakeholder products.<sup>701</sup> In theory the introduction of standards is an option to elevate the use of exchanges, however, large scale adoption will depend on the appetite by exchanges and other crypto-currency participants.

## 6.5: Scale and sustainability

There is, as yet, no evidence of extension of failures in the crypto-currency network to other areas of the banking sector. Thus, there is no evidence of systemic failures in the broader financial system. As prudential regulation protects against systemic failures there is no need to regulate prudentially crypto-currencies and the network. There are a number of issues with scale. Blockchain is currently processing around \$2m a day of bitcoin transaction which is insignificant given the economy of USA.<sup>702</sup> In doing so bitcoin transactions are little more than a sideshow compared with American payment processors' volume of transactions. It is simply not feasible to suggest that this is scalable technology to use for everyday transactions and disrupt payment services providers such as VISA or Mastercard in relation to consumer transactions. Nor can crypto-currencies offer credit facilities nor direct debits. While crypto-currencies will increase in popularity, given the hurdles they are required to overcome, they will remain a niche product amongst those who believe, trust and invest in the network for the foreseeable future.

Additionally, given the amount of energy required to successfully mine<sup>703</sup> it is not inconceivable there could be a situation similar to GAW miners where the miners become insolvent leaving a considerable electricity bill.<sup>704</sup> This could potentially have consequences given the number of larger players in the market. As the technology required to successfully mine increases in

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<sup>699</sup> Emily Spaven, *Isle of Man Introduces Regulation for Bitcoin Businesses*, (Coindesk, USA, 26 March 2015) <<http://www.coindesk.com/isle-of-man-introduces-regulation-for-bitcoin-businesses/>> accessed 11 July 2015.

<sup>700</sup> CAT stood for Charges, Access and Terms.

<sup>701</sup> The Guardian, *What is a Cat standard?* (The Guardian, London, 16 February 2005) <<http://www.theguardian.com/money/2005/feb/16/isas1>> accessed 11 July 2015.

<sup>702</sup> Number of bitcoin transactions per day, taken on a 7 day rolling average <[https://blockchain.info/charts/n-transactions?showDataPoints=false&timespan=&show\\_header=true&daysAverageString=7&scale=0&address=](https://blockchain.info/charts/n-transactions?showDataPoints=false&timespan=&show_header=true&daysAverageString=7&scale=0&address=)> accessed 11 July 2015.

<sup>703</sup> Danny Bradbury, *What is the Carbon Footprint of a Bitcoin?* (Coindesk, USA, 7 April 2014) <<http://www.coindesk.com/carbon-footprint-bitcoin/>> accessed 11 July 2015.

<sup>704</sup> Stan Higgins, *GAW Miners Absent in Ongoing Mississippi Court Case*, 18 June 2015 (Coindesk, USA, 18 June 2015) <<http://www.coindesk.com/gaw-miners-absent-court-case/>> accessed 3 August 2015.

complexity the profit margins will decrease and affect the scalability of crypto-currencies.

## 6.6: Final thoughts

To have confidence in the crypto-currency system it is necessary to have confidence in the system and payment services provider regulation. It is submitted that Anti Money Laundering [AML] is the very minimum requirement. The introduction of Certification marks, CRYPT sourcebook, inclusion as a regulated activity and association authorisation alongside consideration of scalability are all secondary once AML and legitimacy of crypto-currencies is confirmed.













The Government recognise this is an area of continuing growth and it will be crucial to assess the longevity of crypto-currencies as a means of exchange. As such the Government has announced a new research initiative to bring together Research Councils, Alan Turing Institute and Digital Catapult with industry to address research opportunities and challenges for digital currency technology.<sup>705</sup> It is probable that the underlying technology, the Blockchain, will outlive the crypto-currencies themselves. Banks are now involved in deploying the technology in internal products. This is comparable to the music industry where established companies built on the initial steps by innovators in the market.

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<sup>705</sup> HM Treasury, *Digital Currencies: Response to the Call for Information* <<https://www.gov.uk/government/consultations/digital-currencies-call-for-information>> accessed 11 July 2015, at 4.7.

# **APPENDICES**

**Appendix 1A: Top 12 Crypto-Currencies (December 2014)**

#	Name	Market Cap	Price	Available Supply
1	 <a href="#">Bitcoin</a>	\$ 4,443,852,054	<a href="#">\$ 326.11</a>	<a href="#">13,626,850 BTC</a>
2	 <a href="#">Ripple</a>	\$ 702,090,818	<a href="#">\$ 0.022735</a>	<a href="#">30,881,360,458 XRP</a> *
3	 <a href="#">Litecoin</a>	\$ 102,175,799	<a href="#">\$ 2.93</a>	<a href="#">34,868,954 LTC</a>
4	 <a href="#">BitShares</a>	\$ 39,804,213	<a href="#">\$ 0.015935</a>	<a href="#">2,497,973,773 BTS</a> *
5	 <a href="#">MaidSafeCoin</a>	\$ 20,760,435	<a href="#">\$ 0.045874</a>	<a href="#">452,552,412 MAID</a> *
6	 <a href="#">DogeCoin</a>	\$ 20,089,997	<a href="#">\$ 0.000207</a>	<a href="#">96,922,022,508 DOGE</a>
7	 <a href="#">Stellar</a>	\$ 18,568,418	<a href="#">\$ 0.005228</a>	<a href="#">3,551,439,650 STR</a> *
8	 <a href="#">Nxt</a>	\$ 16,209,553	<a href="#">\$ 0.016210</a>	<a href="#">999,997,096 NXT</a> *
9	 <a href="#">Peercoin</a>	\$ 12,634,026	<a href="#">\$ 0.575611</a>	<a href="#">21,948,896 PPC</a>
10	 <a href="#">Counterparty</a>	\$ 10,487,084	<a href="#">\$ 3.96</a>	<a href="#">2,646,690 XCP</a> *
11	 <a href="#">Darkcoin</a>	\$ 9,800,971	<a href="#">\$ 1.98</a>	<a href="#">4,960,533 DRK</a>
12	 <a href="#">Namecoin</a>	\$ 8,533,700	<a href="#">\$ 0.811273</a>	<a href="#">10,518,900 NMC</a>















\* Not mineable<sup>706</sup>

## **Appendix 1B: Top 12 Crypto-Currencies (May 2015)**

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<sup>706</sup> Reproduced from coinmarketcap. Information correct at 20 December 2014 < <http://coinmarketcap.com/> > accessed 20 December 2014.

#	Name	Market Cap	Price	Available Supply
1	 <a href="#">Bitcoin</a>	\$ 3,357,166,146	<a href="#">\$ 236.91</a>	<a href="#">14,170,400 BTC</a>
2	 <a href="#">Ripple</a>	\$ 208,140,758	<a href="#">\$ 0.006523</a>	<a href="#">31,908,551,587 XRP</a> *
3	 <a href="#">Litecoin</a>	\$ 56,781,003	<a href="#">\$ 1.45</a>	<a href="#">39,094,604 LTC</a>
4	 <a href="#">Dash</a>	\$ 15,900,822	<a href="#">\$ 2.96</a>	<a href="#">5,373,170 DASH</a>
5	 <a href="#">Stellar</a>	\$ 12,552,972	<a href="#">\$ 0.002597</a>	<a href="#">4,834,444,006 STR</a> *
6	 <a href="#">Dogecoin</a>	\$ 11,545,006	<a href="#">\$ 0.000116</a>	<a href="#">99,434,192,083 DOGE</a>
7	 <a href="#">Nxt</a>	\$ 9,251,123	<a href="#">\$ 0.009251</a>	<a href="#">999,997,096 NXT</a> *
8	 <a href="#">BitShares</a>	\$ 9,088,328	<a href="#">\$ 0.003622</a>	<a href="#">2,509,520,303 BTS</a> *
9	 <a href="#">MaidSafeCoin</a>	\$ 8,629,088	<a href="#">\$ 0.019068</a>	<a href="#">452,552,412 MAID</a> *
10	 <a href="#">BanxShares</a>	\$ 7,520,918	<a href="#">\$ 1.45</a>	<a href="#">5,202,663 BANX</a> *
11	 <a href="#">Peercoin</a>	\$ 5,697,933	<a href="#">\$ 0.255220</a>	<a href="#">22,325,574 PPC</a>
12	 <a href="#">Bytecoin</a>	\$ 4,522,131	<a href="#">\$ 0.000026</a>	<a href="#">172,886,143,001 BCN</a>

\* Not mineable

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<sup>707</sup> Reproduced from coinmarketcap. Information correct at 17 May 2015 < <http://coinmarketcap.com/> > accessed 17 May 2015

## Appendix 2A: BTC.sx Terms and Conditions

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<sup>708</sup> < <https://btc.sx/> > accessed 20 December 2014

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## **9. Limitation of Liability**

9.1 In no event will BTC.sx, or its suppliers or licensors, be liable with respect to any subject matter of this agreement under any contract, negligence, strict liability or other legal or equitable theory for: (i) any special, incidental or consequential damages; (ii) the cost of procurement or substitute products or services; (iii) for interruption of use or loss or corruption of data; or (iv) for any amounts that exceed the fees paid by you to BTC.sx under this agreement during the twelve



(12) month period prior to the cause of action. BTC.sx shall have no liability for any failure or delay due to matters beyond their reasonable control. The foregoing shall not apply to the extent prohibited by applicable law.

## **10. Funding Charges**

10.1 Trades placed with BTC.sx are subject to daily funding charges. The most up-to-date charges are shown here, however, these charges are subject to change without notice.

## **11. Calculations**

11.1 All calculations performed by the BTC.sx trading engine and as verified by BTC.sx are final. Our methodology is outlined here. As noted in clause 6.1, BTC.sx does not warrant that the use of the Website will be uninterrupted or error free.

## **12. Termination & Remedies for Breach of these Terms by You**

a) BTC.sx reserves the right to seek all remedies available at law and in equity for violations of these Terms, including without limitation, the right to restrict, suspend or terminate your account or deny you access to the Website without notice; and

b) BTC.sx shall be entitled to disclose your user identity and personal details if required or requested by a court of law, governmental agency or any other law enforcement authority in such circumstances as BTC.sx in its sole discretion considers reasonably necessary or appropriate.

## **13. Absence of Waiver**

13.1 Any failure or delay by BTC.sx to enforce any of the Terms or to exercise any right under the Terms will not be construed as a waiver to any extent of our rights.

## **14. Force Majeure**

14.1 Neither party is liable for delay in meeting its obligations due to any cause outside its reasonable control including acts of god, riot, war, malicious acts of damage, fires, electricity supply failure, Government authority.

## **15. Survival**

15.1 Should any provision of these Terms be held to be void, invalid, unenforceable or illegal by a court, the validity and enforceability of the other provisions shall not be affected. If any provision is determined to be unenforceable, you agree to an amendment by BTC.sx of such provision to provide for enforcement of the provisions intent, to the extent permitted by applicable law.

## **16. Governing Law**

The Terms are governed by and construed in accordance with English law. You agree to the exclusive jurisdiction of the English courts.

## **BTC.sx Privacy Policy**

We respect your privacy and are committed to protecting it through means outlined within this policy.

The policy sets out the different areas where user privacy is concerned and outlines the obligations & requirements of the users and the website.

Furthermore the way this website processes, stores and protects user data and information will also be detailed within this policy.

BTC.sx is organised primarily to provide registered users with bitcoin services. The services offered include the transfer of digital tokens known as bitcoins.

## The Website

This website and its owners take a proactive approach to user privacy and ensure the necessary steps are taken to protect the privacy of its users. This website complies with UK and EU laws and requirements for user privacy. Storage

The data that we collect from you may be transferred to, and stored at, a destination outside the UK and EU.

## Use of Cookies

BTC.sx may use cookies to better the users experience while visiting. Where applicable this website will use a cookie control system allowing the user to allow or disallow the use of cookies on their computer / device. This complies with recent legislation requirements for websites to obtain explicit consent from users before leaving behind or reading files such as cookies on a users computer / device.

Cookies are small files saved to the user's computer hard drive that track, save and store information about the users interactions and usage of the website. This allows the website, through it's server to provide the users with a tailored experience within this website.

Users are advised that if they wish to deny the use and saving of cookies from this website on to their computers hard drive they should take necessary steps within their web browsers security settings to block all cookies from this website. This website uses tracking software to monitor it's visitors to better understand how they use it. This software is provided by Google Analytics which may use cookies to track visitor usage. You can read Google's privacy policy here for further information <http://www.google.com/privacy.html>.

## Contact & Communication

Users contacting BTC.sx do so at their own discretion and provide any such personal details requested at their own risk. Your personal information is kept private and stored securely until a time it is no longer required or has no use, as detailed in the UK Data Protection Act 1998.

We use any information submitted to provide you with further information about the products and services we offer or to assist you in answering any questions or queries you may have submitted. This includes using your details to inform you of important announcements. This is by no means a comprehensive list of your user rights in regard to receiving email-marketing material. Your details are not passed on to any third parties.

### Cryptographic hashes

Users sending bitcoins to this website through the use of cryptographic hashes and keys take full responsibility for the risks involved. By using services offered by BTC.sx you will automatically accept liability of any loss, damages or implications incurred through the use of this website. BTC.sx and its owners will not be held liable for any loss of bitcoin.

Users who do not agree can request the return of their bitcoin through the use a withdrawal once logged in.

### Security

No cryptographic private keys or bitcoin private keys are held on BTC.sx servers. Bitcoins sent to cryptographic public keys displayed on this website are immediately forwarded to offline vaults.

### External Links

Although this website only looks to include quality, safe and relevant external links users should always adopt a policy of caution before clicking any external web links mentioned throughout this website.

We cannot guarantee or verify the contents of any externally linked website despite their best efforts. Users should therefore note they click on external links at their own risk and this website and it's owners cannot be held liable for any damages or implications caused by visiting any external links.

### Correct Personal Information

In accordance to The Data Protection Act 1998 (UK), users have the right to access any Personal Information held. Upon request, we will inform you of the Personal Information relating to your account, the use and relevant disclosure. Subject to a maximum fee no greater than GBP10 or agreed equivalent, we will send you a copy of all Personal Information retained.

Where possible, the website will enable users to update inaccurate or incorrect information. Additionally update requests can be made by emailing the site's owners at [support@btc.sx](mailto:support@btc.sx).

### Changes to this Policy

We may revise this Privacy Policy from time to time. If we make a change to this policy that, in our sole discretion, is material, we will take steps to notify all users by a notice on the site. By

continuing to access or use the Services after those changes become effective, you agree to be bound by the revised Privacy Policy.

### [Contact Us](#)

If you have any concerns regarding our Privacy Policy, please contact us for more information.

E-Mail [support@btc.sx](mailto:support@btc.sx)

Effective: October 23, 2014

## Appendix 2B: Bitstamp Terms of Use<sup>709</sup>

### TERMS OF USE

#### ACCEPTANCE OF TERMS OF USE

By using this website ("Site"), registering for a Bitstamp Account ("Account"), or using any of our other Bitstamp Services, you ("you, your, or yourself") are agreeing to accept and comply with the terms and conditions of use stated below ("Terms of Use"). You should read the entire Terms of Use carefully before you use this Site or any of the Bitstamp Services.

As used in this Terms of Use, "Bitstamp" refers to the company Bitstamp Limited, including, without limitation, its owners, directors, investors, employees or other related parties. Depending upon the context, "Bitstamp" may also refer to the services, products, website, content or other materials (collectively, "Bitstamp Services") provided by Bitstamp.

The Service operated by Bitstamp allows buyers ("Buyers") and sellers ("Sellers"), to buy and sell the Internet currency known as "Bitcoins" (see <http://bitcoin.org>).

The Service operated by Bitstamp also allows all registered users of the Service ("Members") to:

- Transfer Bitcoins to other Members or other users of Bitcoin outside the Bitstamp site.
- Use Bitcoins for purchasing goods.
- Buy the Internet currency known as XRP.
- Access and use the Ripple system.

Depending on your country of residence, you may not be able to use all the functions of the Site. It is your responsibility to follow those rules and laws in your country of residence and/or country from which you access this Site and Services. As long as you agree to and comply with these Terms of Use, Bitstamp grants to you a personal, non-exclusive, non-transferable, non-sublicensable and limited right to enter and use the Site and the Service.

#### IF YOU DO NOT ACCEPT THE TERMS OF USE AND CONDITIONS OUTLINED IN THIS AGREEMENT, DO NOT ACCESS THIS SITE AND DO NOT USE THIS SERVICE.

By opening an Account, you expressly represent and warrant:

- 1. You have accepted these Terms; and
- 2. You are at least 18 years of age and have the full capacity to accept these Terms and enter into a transaction involving Bitcoins.

<sup>709</sup> <<https://www.bitstamp.net/>> accessed 20 December 2014

## RISKS

The trading of goods and products, real or virtual, as well as virtual currencies involves significant risk. Prices can and do fluctuate on any given day. Due to such price fluctuations, you may increase or lose value in your assets at any given moment. Any currency - virtual or not - may be subject to large swings in value and may even become worthless. There is an inherent risk that losses will occur as a result of buying, selling or trading anything on a market.

Bitcoin trading also has special risks not generally shared with official currencies or goods or commodities in a market. Unlike most currencies, which are backed by governments or other legal entities, or by commodities such as gold or silver, Bitcoin is a unique kind of "fiat" currency, backed by technology and trust. There is no central bank that can take corrective measure to protect the value of Bitcoins in a crisis or issue more currency.

Instead, Bitcoin is an as-yet autonomous and largely unregulated worldwide system of currency firms and individuals. Traders put their trust in a digital, decentralised and partially anonymous system that relies on peer-to-peer networking and cryptography to maintain its integrity.

Bitcoin trading is probably susceptible to irrational (or rational) bubbles or loss of confidence, which could collapse demand relative to supply. For example, confidence might collapse in Bitcoin because of unexpected changes imposed by the software developers or others, a government crackdown, the creation of superior competing alternative currencies, or a deflationary or inflationary spiral. Confidence might also collapse because of technical problems: if the anonymity of the system is compromised, if money is lost or stolen, or if hackers or governments are able to prevent any transactions from settling. There may be additional risks that we have not foreseen or identified in our Terms of Use.

You should carefully assess whether your financial situation and tolerance for risk is suitable for buying, selling or trading Bitcoins.

We use our banking providers in order to receive client moneys and making payments. Our banking providers DO NOT transfer Bitcoins, exchange Bitcoins, or provide any services in connection with Bitcoins.

## LIMITED RIGHT OF USE

Unless otherwise specified, all Materials on this Site are the property of Bitstamp and are protected by copyright, trademark and other applicable laws. You may view, print and/or download a copy of the Materials from this Site on any single computer solely for your personal, informational, non-commercial use, provided you keep intact all copyright and other proprietary notices.

The trademarks, service marks and logos of Bitstamp and others used in this Site ("Trademarks") are the property of Bitstamp and their respective owners. The software, text, images, graphics, data, prices, trades, charts, graphs, video and audio used on this Site belong to Bitstamp. The Trademarks and Material should not be copied, reproduced, modified, republished, uploaded, posted, transmitted, scraped, collected or distributed in any form or by any means, whether manual or automated. The use of any such Materials on any other Site or networked computer environment for any other purpose is

strictly prohibited; any such unauthorised use may violate copyright, trademark and other applicable laws and could result in criminal or civil penalties.

## MAINTAINING YOUR ACCOUNT: OUR RULES

This Site is for your personal and non-commercial use only. We are vigilant in maintaining the security of our Site and the Service. By registering with us, you agree to provide Bitstamp with current, accurate, and complete information about yourself as prompted by the registration process, and to keep such information updated. You further agree that you will not use any Account other than your own, or access the Account of any other Member at any time, or assist others in obtaining unauthorised access.

The creation or use of Accounts without obtaining the prior express permission from Bitstamp will result in the immediate suspension of all said Accounts, as well as all pending purchase/sale offers. Any attempt to do so or to assist others (Members or otherwise), or the distribution of instructions, software or tools for that purpose, will result in the Accounts of such Members being terminated. Termination is not the exclusive remedy for such a violation, and Bitstamp may elect to take further action against you. You also are responsible for maintaining the confidentiality of your Account information, including your password, safeguarding your own Bitcoin, and for all activity including Transactions that are posted to your Account. If there is suspicious activity related to your Account, we may, but are not obligated, to request additional information from you, including authenticating documents, and to freeze any transactions pending our review. You are obligated to comply with these security requests, or accept termination of your Account. You are required to notify Bitstamp immediately of any unauthorised use of your Account or password, or any other breach of security by email addressed to [support@bitstamp.net](mailto:support@bitstamp.net). Any Member who violates these rules may be terminated, and thereafter held liable for losses incurred by Bitstamp or any user of the Site.

Bitstamp similarly reserves the right to freeze Ripple accounts in accordance with the new policy announced by Ripple Labs set to take effect September 15, 2014. As explained by Ripple Labs:

The freeze protocol extension gives gateways the ability to 1) globally freeze all their issued funds, or 2) freeze funds issued to a particular user. Frozen funds may only be sent back to the gateway who issued them. The global freeze feature allows a gateway to freeze all balances issued by it. The gateway may still issue payments. Accounts holding frozen balances may return the funds to the gateway. This feature is useful for migrating users from one account to another and to safeguard users in the event of a compromise of the gateway account. The individual freeze is intended primarily for complying with regulatory requirements which may vary from one jurisdiction to another. It also allows gateways to freeze individual accounts issuances in order to investigate suspicious activity. These features allow gateways to better operate in compliance of laws and regulations.

Finally, you agree that you will not use the Service to perform criminal activity of any sort, including but not limited to, money laundering, illegal gambling operations, terrorist financing, or malicious hacking. The minimum allowable trade is \$5.

## TERMINATION AND ESCROW OF UNVERIFIED ACCOUNTS

You may terminate this agreement with Bitstamp, and close your Account at any time, following settlement of any pending transactions.

You also agree that Bitstamp may, by giving notice, in its sole discretion terminate your access to the Site and to your Account, including without limitation, our right to: limit, suspend or terminate the service and Members' Accounts, prohibit access to the Site and its content, services and tools, delay or remove hosted content, and take technical and legal steps to keep Members off the Site if we think that they are creating problems or possible legal liabilities, infringing the intellectual property rights of third parties, or acting inconsistently with the letter or spirit of these Terms. Additionally, we may, in appropriate circumstances and at our discretion, suspend or terminate Accounts of Members for any reason, including without limitation: (1) attempts to gain unauthorised access to the Site or another Member's account or providing assistance to others' attempting to do so, (2) overcoming software security features limiting use of or protecting any content, (3) usage of the Service to perform illegal activities such as money laundering, illegal gambling operations, financing terrorism, or other criminal activities, (4) violations of these Terms of Use, (5) failure to pay or fraudulent payment for Transactions, (6) unexpected operational difficulties, or (7) upon the request of law enforcement or other government agencies, if deemed to be legitimate and compelling by Bitstamp, acting in its sole discretion.

We expressly reserve the right to cancel and/or terminate Accounts that have not been verified by the Client despite our good faith efforts to contact you seeking such verification ("Unverified Accounts"). All Unverified Accounts which have been inactive for a period of 6 months or more are further subject to transfer to a third-party escrow (the "Unverified Escrow"), and will no longer be maintained or be the legal responsibility of Bitstamp Ltd. The administrator/trustee of the Unverified Escrow shall make any and all additional reasonable efforts required by law to determine and contact each Unverified Account owner and, after suitable effort and time, will donate any residual Bitcoin or cash in these unclaimed Unverified Accounts to a nonprofit group or groups involved in the Bitcoin ecosystem.

The suspension of an Account shall not affect the payment of the commissions due for past Transactions. Upon termination, Members shall communicate a valid bank account to allow for the transfer of any currencies credited to their account. Said bank account shall be held by the Member. Bitcoins may be transferred to a valid bank account only after conversion into a currency. Bitstamp shall transfer the currencies as soon as possible following the Member's request in the time frames specified by Bitstamp.

Bitstamp will send to you the credit balance of your Account, however in circumstances a number of intermediaries may be involved in an international payment and these or the beneficiary bank may deduct charges. We will use reasonable efforts to ensure that such charges are disclosed to you prior to sending your payment, however where they cannot be avoided, you acknowledge that these charges cannot always be calculated in advance, and that you agree to be responsible for such charges.

Upon Account closing, any amount less than \$5 in value will not be returned.



## AVAILABILITY OF SERVICES

All services are provided without warranty of any kind, either express or implied. We do not represent that this Site will be available 100% of the time to meet your needs. We will strive to provide you with the Service as soon as possible but there are no guarantees that access will not be interrupted, or that there will be no delays, failures, errors, omissions or loss of transmitted information.

We will use reasonable endeavours to ensure that the Site can normally be accessed by you in accordance with these Terms of Use. We may suspend use of the Site for maintenance and will make reasonable efforts to give you notice. You acknowledge that this may not be possible in an emergency.

## APIS AND WIDGETS

We may provide access to certain parties to access specific data and information through our API (Application Programming Interface) or through widgets. We also may provide widgets for your use to put our data on your Site. You are free to use these in their original unmodified and un-altered state.

## EXTERNAL WEBSITES

Bitstamp makes no representations whatsoever about any outside or third party website which you may access through the Site. Occasionally, the Bitstamp website may provide references or links to other websites ("External Websites"). We do not control these External Websites third party sites or any of the content contained therein. You agree that we are in no way responsible or liable for External Websites referenced or linked from the Bitstamp website, including, but not limited to, website content, policies, failures, promotions, products, opinions, advice, statements, prices, activities and advertisements, services or actions and/or any damages, losses, failures or problems caused by, related to, or arising from those sites. You shall bear all risks associated with the use of such content. External Websites have separate and independent terms of use and related policies. We request that you review the policies, rules, terms, and regulations of each site that you visit. It is up to you to take precautions to ensure that whatever you select for your use is free of such items as viruses, worms, Trojan horses and other items of a destructive nature.

## FINANCIAL ADVICE

For the avoidance of doubt we do not provide any investment advice in connection with the Services contemplated by these Terms of Use. We may provide information on the price, range, volatility of Bitcoins and events that have affected the price of Bitcoins but this is not considered investment advice and should not be construed as such. Any decision to purchase or sell Bitcoins is your decision and we will not be liable for any loss suffered.

## FINANCIAL REGULATION

Our business model, and our Service, consists of facilitating the buying, selling and trading of Bitcoins and their use to purchase goods in an unregulated, international open payment system. The Services we provide are currently unregulated within the UK.

## EMAIL

Email messages sent over the Internet are not secure and Bitstamp is not responsible for any damages incurred by the result of sending email messages over the Internet. We suggest sending email in encrypted formats; you are welcome to send PGP encrypted emails to us. The instructions and keys to do so are available upon request.

## DISCLOSURES TO LEGAL AUTHORITIES AND AUTHORIZED FINANCIAL INSTITUTIONS

We may share your Personal Information with law enforcement, data protection authorities, government officials, and other authorities when:

- Required by law;
- Compelled by subpoena, court order, or other legal procedure;
- We believe that the disclosure is necessary to prevent physical harm or financial loss;
- Disclosure is necessary to report suspected illegal activity; or
- Disclosure is necessary to investigate violations of our Terms of Use or [Privacy Policy](#).

With respect to US residents, we also may share your information with other financial institutions as authorized under Section 314(b) of the US Patriot Act, and with tax authorities, including the US Internal Revenue Service, pursuant to the Foreign Account Tax Compliance Act ("FATCA"), to the extent that this statute may be determined to apply to Bitstamp Ltd. "Personal Information" refers to information that identifies an individual, such as name, address, e-mail address, trading information, and banking details. "Personal Information" does not include anonymised and/or aggregated data that does not identify a specific user.

## INTERNATIONAL TRANSFERS OF PERSONAL INFORMATION

We store and process your Personal Information in data centres around the world, wherever Bitstamp facilities or service providers are located. As such, we may transfer your Personal Information outside of the European Economic Area ("EEA"). Such transfers are undertaken in accordance with our legal and regulatory obligations.

## JURISDICTION

The Terms of Use shall be governed and construed in accordance with English Law. The parties agree to irrevocably submit to the exclusive jurisdiction of the English Courts.

## LIMITATION OF LIABILITY

To the extent permitted by law, Bitstamp will not be held liable for any damages, loss of profit, loss of revenue, loss of business, loss of opportunity, loss of data, indirect or consequential loss unless the loss suffered arising from negligence or wilful deceit or fraud. Nothing in these terms excludes or limits the liability of either party for fraud, death or personal injury caused by its negligence, breach of terms implied by operation of law, or any other liability which may not by law be limited or excluded.

Subject to the foregoing, Bitstamp's aggregate liability in respect of claims based on events arising out of or in connection with any single Member's use of the Site and/or Service, whether in contract or tort (including negligence) or otherwise, shall in no circumstances exceed the greater of either (a) the total amount held on Account for the Member making a claim less any amount of Commission that may be due and payable in respect of such Account; or (b) 125% of the amount of the Transaction(s) that are the subject of the claim less any amount of Commission that may be due and payable in respect of such Transaction(s).

## INDEMNITY

To the full extent permitted by applicable law, you hereby agree to indemnify Bitstamp, and its partners against any action, liability, cost, claim, loss, damage, proceeding or expense suffered or incurred if direct or not directly arising from your use of Bitstamp's Sites, your use of the Service, or from your violation of these Terms of Use.

## MISCELLANEOUS

If we are unable to perform the Services outlined in the Terms of Use due to factors beyond our control including but not limited to an event of Force Majeure, change of law or change in sanctions policy we will not have any liability to you with respect to the Services provided under this agreement and for a time period coincident with the event.

## MODIFICATION OF TERMS

Bitstamp reserves the right to change, add or remove portions of these Terms, at any time, in an exercise of its sole discretion. You will be notified of any changes in advance through your Account. Upon such notification, it is your responsibility to review the amended Terms. Your continued use of the Site following the posting of a notice of changes to the Terms signifies that you accept and agree to the changes, and that all subsequent transactions by you will be subject to the amended Terms.

## DEFINITIONS

**Account.** The contractual arrangement wherein a Bitstamp Member has accepted our Terms of Use and [Privacy Policy](#), and received approval to use the Bitstamp Services, including the purchase and sale of Bitcoins and to perform associated Transactions.

**Bitcoins.** The Peer-to-Peer internet currency further described at <http://bitcoin.org>.

**Buyer(s).** Member(s) that are submitting an offer to buy Bitcoins through the Service.

**Commission.** Refers to the fee which is payable to Bitstamp on each Transaction, such as a Bitcoin Purchase Transaction.

**Member(s).** Refers to Buyers and Sellers as well as any holder of an Account.

**Personal Information.** Information that identifies an individual, such as name, address, e-mail address, trading information, and banking details. "Personal Information" does not include anonymised and/or aggregated data that does not identify a specific user.

**Price.** The "price per coin" for which Members are willing to purchase or sell Bitcoins, using the Service in a Bitcoin Purchase Transaction. The Price may be expressed in any of the currencies deposited by Members in their Account and supported by the Service. See our Site for a full list of currencies.

**Seller(s).** Member(s) that are submitting an offer to sell Bitcoins through the Service.

**Service(s).** The technological platform, functional rules and market managed by Bitstamp Ltd. to permit Sellers and Buyers to perform purchase and sale transactions of Bitcoins.

**Transaction.** Includes the following:

- The agreement between the Buyer and the Seller to exchange Bitcoins through the Service for currencies at a commonly agreed rate ("Bitcoin Purchase Transaction");
- The conversion of currencies into Bitcoins deposited by Members on their Account ("Conversion Transaction");
- The transfer of Bitcoins among Members ("Bitcoin Transfer Transaction");
- The transfer of currencies among Members ("Currency Transfer Transaction"); and
- The purchase of ancillary products ("Purchase Transactions").

Bitstamp may not offer all of these types of transactions at this time or in all places.

**Transaction Price.** The total price paid by the Buyer in respect of each Transaction performed through the Service.

## CONTACT US

If you have any questions relating to these Terms of Use, your rights and obligations arising from these Terms and/or your use of the Site and the Service, your Account, or any other matter, please contact [support@bitstamp.net](mailto:support@bitstamp.net).

## Appendix 2C: ANXBTC<sup>710</sup>

In using this website you are deemed to have read and agreed to the following terms of use:

These Terms and Conditions (the 'Terms') set out the conditions under which ANXBTC.COM, a company incorporated under the laws of Hong Kong (hereinafter, 'ANXBTC.COM') offer you use of the ANXBTC.COM Website at <https://ANX-PRO.COM> (the 'Site' or 'Website') and access to the ANXBTC.COM Platform (the 'Platform'). Please read these Terms carefully and do not use the Site or the Platform unless you accept them.

Furthermore, the following terminology applies to these Terms and Conditions and any or all Agreements: 'Client', 'Registered Member', 'You' and 'Your' refers to you, the person accessing this website and accepting the Company's terms and conditions. 'The Company', 'Ourselves', 'We' and 'Us', refers to ANXBTC.COM. 'Party', 'Parties', or 'Us', refers to both the Client and ourselves, or either the Client or ourselves. All terms refer to the offer, acceptance and consideration of payment or fees necessary to undertake the services provided by ANXBTC.COM and its' associated Platform.

ANXBTC.COM and its associated Platform facilitates a service whereas registered members can exchange fiat currency for virtual currency.

By registering on and using any of the functions provided by the ANXBTC.COM Site or Platform, you are deemed to have read, understood and accepted all of the following terms & conditions. In addition, by opening an account to use the ANXBTC.COM Platform:

- you have accepted these Terms; and
- you are confirming that you are at least 18 years of age and have the full capacity to accept these Terms and enter into a transaction as a result of using the ANXBTC.COM Platform
- you agree only to trade with legally obtained funds that belong to you
- you agree to take full responsibility for your trading or non-trading actions and any gains or losses sustained as a result of using the ANXBTC.COM platform
- you confirm the details provided upon registration are true and accurate
- you agree to abide by any relevant laws in your jurisdiction, including reporting any trading profits for taxation purposes.

### Changes to Terms

ANX reserves the right, at its sole discretion, to change, add or remove portions of these Terms, at any time. Such notification will be made via the Website. It is your responsibility to review the amended Terms. Your continued use of the Website and Platform following the posting of changes will mean that you accept and agree to the changes and you agree that all subsequent transactions by you will be subject to these Terms.

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<sup>710</sup> <<https://anxbtc.com/pages/#/terms>> accessed 20 December 2014

ANX reserves the right to close inactive accounts that have exhibited no events or transaction activity for a period greater than 6 months. Customers of whom accounts will be closed as a result of this condition will be contacted by ANX using the customers registered email address 14 days prior to account closure. After the account is closed, customers will have 30 days to make arrangements for any funds held in the account or notify ANX by email that they wish to keep the account open. ANX will not be liable for any funds that were held within the account after 30 days from account closure.

#### KYC (Know-Your-Customer) and AML (Anti Money Laundering) Policies

ANX remains committed in providing a safe, globally-compliant and reputable service to its clients. As a company, we pride ourselves on the integrity and transparency of our business. For this reason, ANX relies on comprehensive and thorough KYC (Know-Your-Customer) and AML (Anti Money Laundering) policies.

ANX is legally registered and its infrastructure is physically located in Hong Kong. ANX insists on a comprehensive and thorough KYC (Know-Your-Customer) and AML (Anti Money Laundering) compliance framework. This includes the monitoring of suspicious transactions and obligatory reporting to local regulators and other compliance bodies.

Our AML and KYC policies differ depending on the country of origin of which our clients are located and furthermore recorded against through the ANX registration process. The specific AML and KYC policies as per regional jurisdiction are located below. Our robust compliance framework ensures that regulatory requirements are being adhered to at both a local and global level, instilling a level of trust and ensuring ANX will continue to operate indefinitely.

ANX reserves the right to refuse registration to persons from or in jurisdictions that do not meet international AML standards or could be considered as a Politically Exposed Person.

ANX reserves the right to carry out customer due diligence to verify its users and their transactions. Enhanced customer due diligence will be carried out periodically as part of our ongoing risk review and assessment. In addition to this, any attempt to abuse ANX or its platform will result in an immediate account suspension and reported to the respective authorities.

The ANX AML and KYC policies are as follows:

- Transactions conducted via the ANX platform will be subject to AML transaction monitoring.
- Identity and proof of address documents and transaction records will be maintained for at least six years and will be submitted to regulators as required without prior notification to registered users.
- ANX may at any time without liability and without disclosing any reason, suspend the operation of your account. ANX shall notify you after exercising its rights under this clause.
- Registered members of whom transactions involve fiat currency will be required to verify their identity and adhere to the ANX KYC policy. This includes the submission of both government ID and proof of address. Valid ID includes a passport, national card, or drivers license. Valid

proof of address includes utility and rates bills not older than 3 months. Other forms of ID and Address verification will not be accepted. Your account will be unregistered until account verification has been completed.

- Suspicious transactions will result in a Suspicious Activity Report being submitted to the Joint Financial Intelligence Unit ('JFIU').
- It is your responsibility to determine what, if any, taxes apply to the payments you make or receive, and it is your responsibility to collect, report and remit the correct tax to the appropriate tax authority, regardless of jurisdiction. ANX is not responsible for determining whether taxes apply to your transaction, or for collecting, reporting or remitting any taxes arising from any transaction, to you or any taxation, governing or third authority.
- Trading Bitcoins, virtual currencies and virtual commodities carries a high level of risk, and may not be suitable for everyone. Before deciding to buy or sell these instruments you should carefully consider your investment objectives, level of experience, and risk appetite. The possibility exists that you could sustain a loss of some or all of your investment and therefore you should not invest money that you cannot afford to lose. You should be aware of all the risks associated with virtual commodities, and seek advice from an independent financial adviser should you have any doubts. Furthermore, there may be risks that are not disclosed in our Terms of use. You should use extreme consideration and be conscious of assessing your financial situation and tolerance for risk before engaging in activities involving the trading of virtual commodities.
- Any opinions, news, research, analyses, prices, or other information contained on this website is provided as general market commentary, and does not constitute investment advice. ANX will not accept liability for any loss or damage, including without limitation to, any loss of profit, which may arise directly or indirectly from use of or reliance on such information.
- There are risks associated with utilizing an Internet-based deal execution trading system including, but not limited to, the failure of hardware, software, and Internet connection. As ANX does not control the reliability or availability of the Internet, ANX cannot be responsible for communication failures, distortions or delays when trading via the Internet.
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## Appendix 3 (Price Fluctuations)

Public Choice

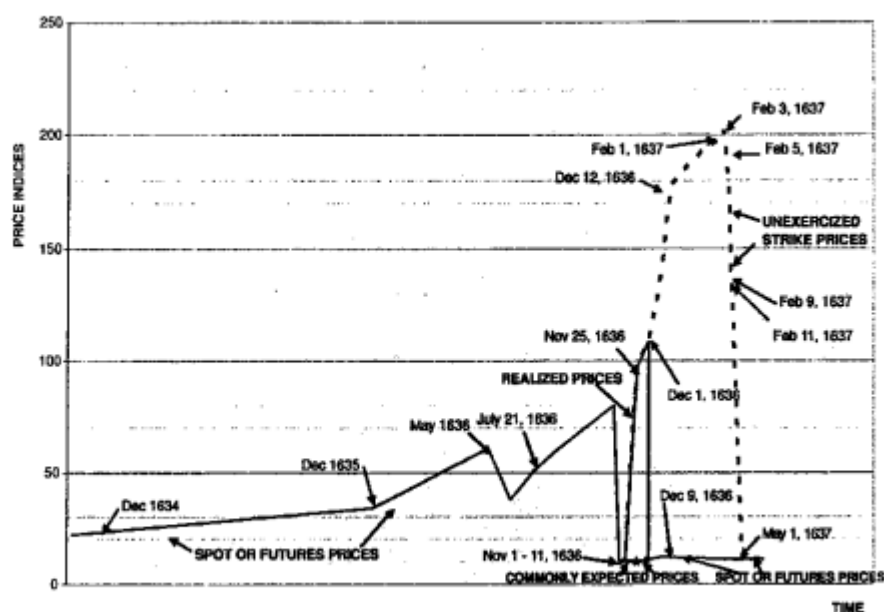


Fig. 3 Tulip prices over the 1634–1637 period

Public Choice

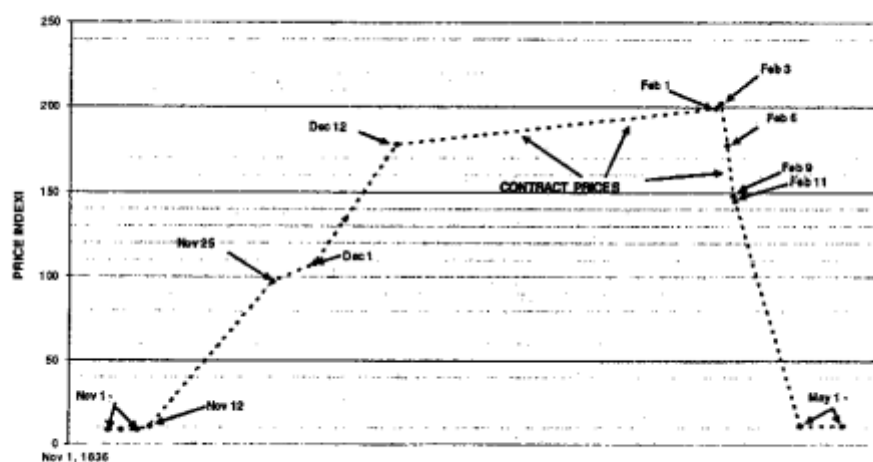
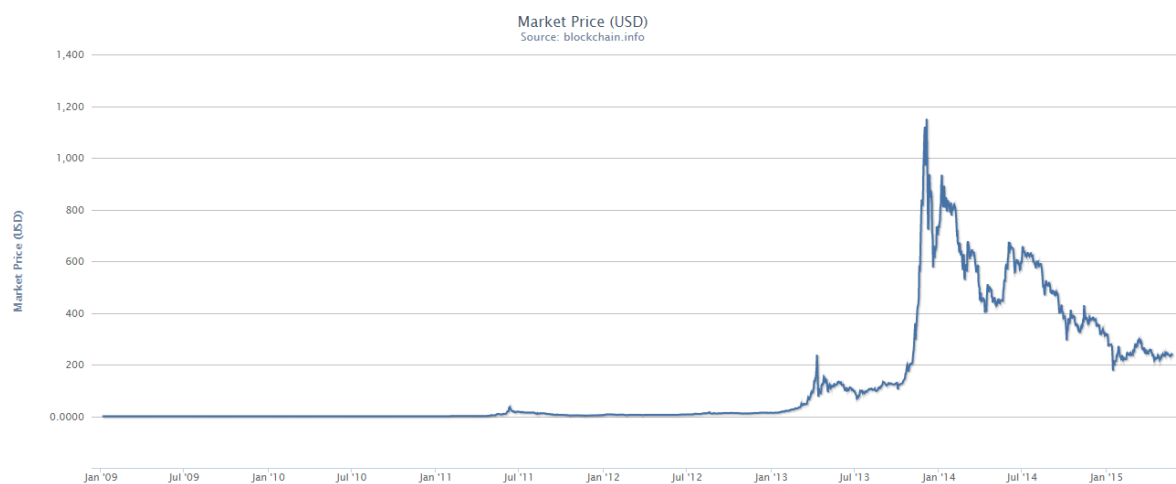


Fig. 1 An index of prices recorded in Dutch tulip contracts

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<sup>711</sup> Earl Thomson, *The tulipmania: Fact or artefact?* 12 June 2006  
<http://www.econ.ucla.edu/thompson/document97.pdf> accessed 24 May 2015.



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<sup>712</sup> Blockchain tables <[https://blockchain.info/charts/market-price?timespan=all&showDataPoints=false&daysAverageString=1&show\\_header=true&scale=0&address=](https://blockchain.info/charts/market-price?timespan=all&showDataPoints=false&daysAverageString=1&show_header=true&scale=0&address=) > accessed 24 May 2015.

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